

October 7, 1957

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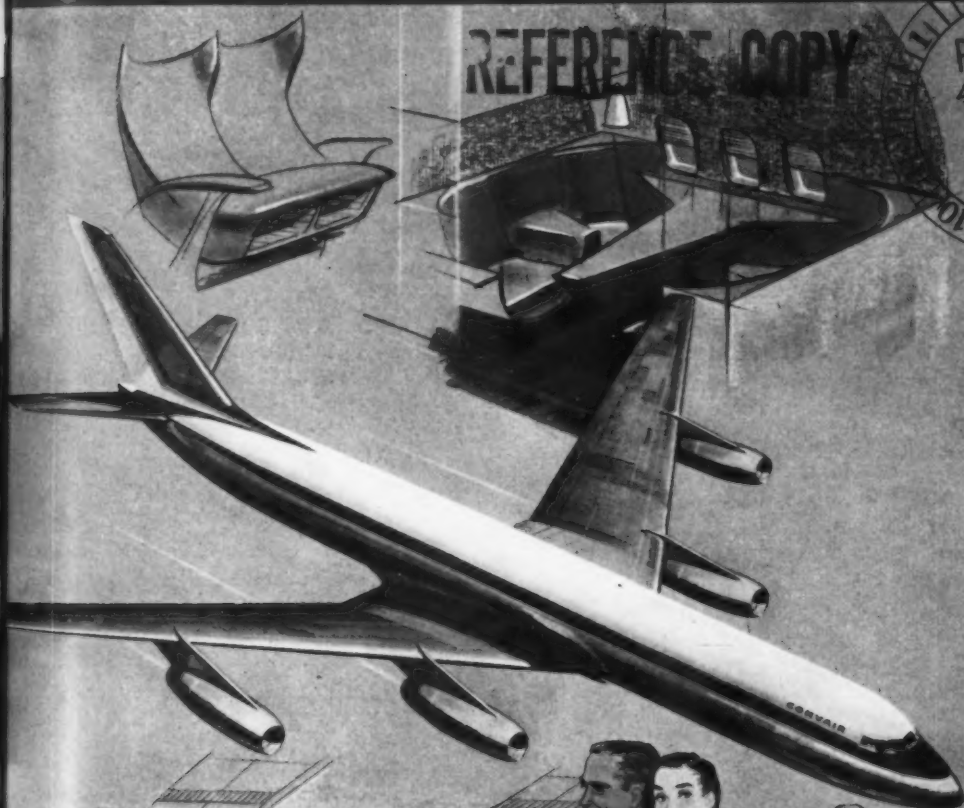
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AMERICAN AVIATION

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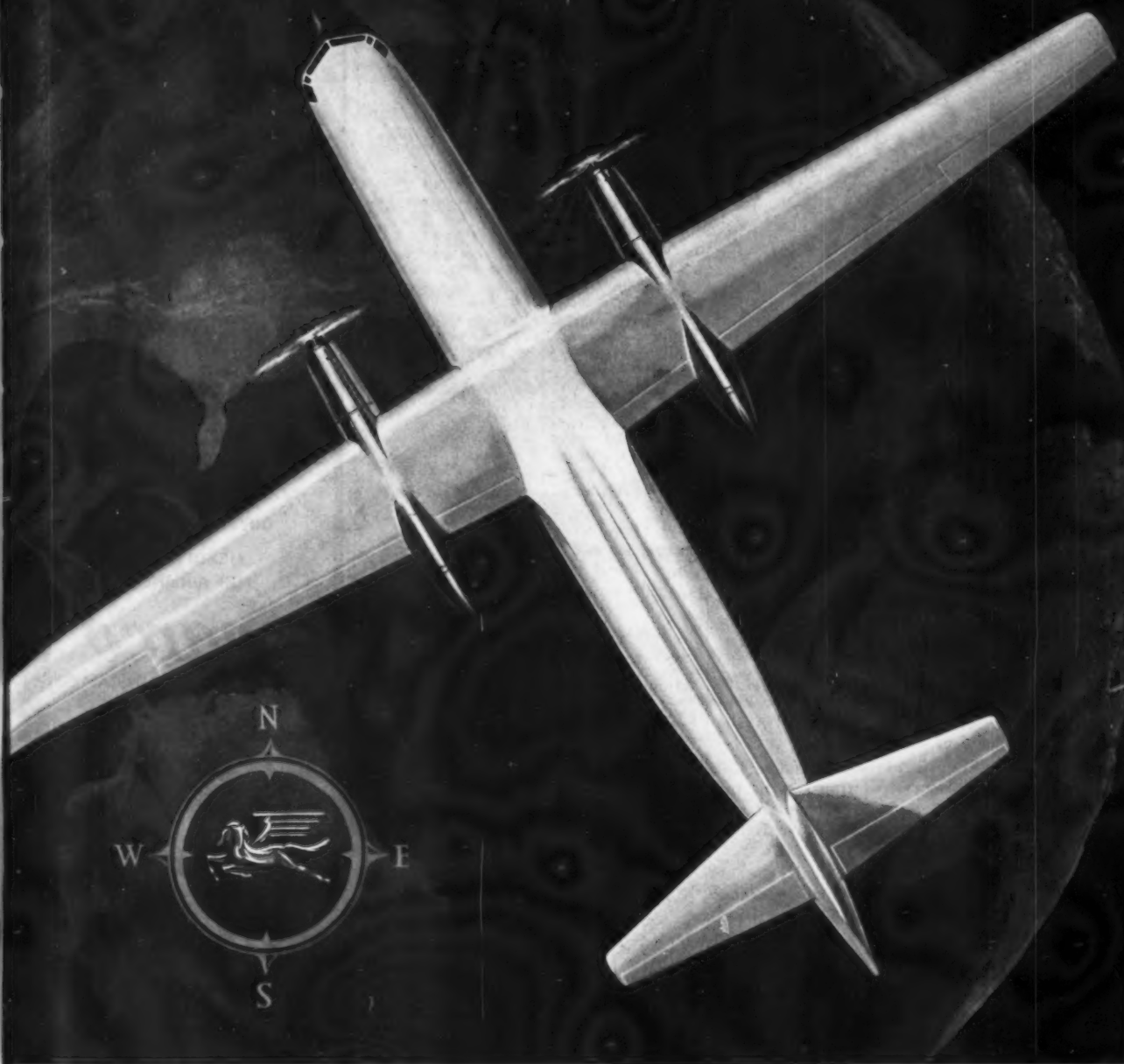
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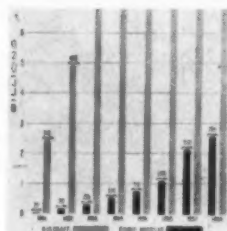
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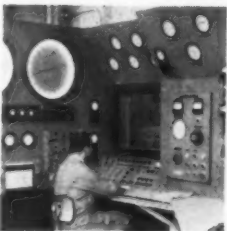
Pentagon revises aviation spending for fiscal '58
Services will spend \$9.7 billion for aircraft and missiles during the year, an increase of nearly a billion over January estimates. This will be just \$300 million under fiscal 1957. See page 29.



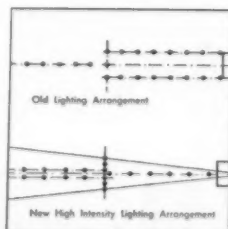
Here's how NB-36N carries airborne reactor
First details of Convair's nuclear reactor-carrying bomber have been released. For pictorial details of how this ticklish task is being carried out over the plains of Texas see page 33.



Better bearings are needed for aircraft, missiles
The bearing manufacturers are aware of the need, but the big problem is paying for the necessary research for high-temperature-resistance antifriction devices. See page 35.



Reds use mobile landing, communications aids
Latest information on how Russia is faring with air traffic control electronics shows they have the equipment, and favor movable vans for mounting it. Read Henry Steier's analysis starting page 45.



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Who's Who at Air Materiel Command, world's largest buyer? . . . You'll find the answer on pages 42 and 43, the latest organizational chart of AMC. Other exclusive features in this issue of AMERICAN AVIATION include a complete rundown on primary pilot training schools' battle for business, p. 71; a pictorial story of Convair's NB-36H, aerial testbed for a reactor, page 33.

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Staff Memo to WWP

(Who's En Routing in Europe)

DEAR CHIEF:

We've acquired a new Defense Secretary while you've been in Europe. Operation Wilson-to-McElroy went off smoothly. Wilson will be missed by many personally. His candor and naive honesty were refreshing. But his last acts as Secretary will haunt his successor and staff.

The spending ceiling is doing drastic things to defense, especially because of the abruptness and rigidity of the enforcement. Some good will surely come of elimination of duplicating missile and aircraft programs, stricter evaluation of new weapons systems. But some repercussions are very bad. The Air Force is the hardest hit. Its fiscal '58 program is still not firmed up. Its plane shopping list is down to about a thousand planes; more cuts may come. Navy has cut its plane program too. One official says any further cuts will have to be vertical, since all the horizontal cuts or pruning possible has been done. Vertical cuts will mean demise of complete programs, under a new priority system, similar to the USAF Navaho and Navy Triton slashes.

A lot of Washington observers are sure the spending ceiling will catch up with the Defense Dept. in a few years, and that this is only a temporary political expediency. That oldsters feel that unless the basic military foundation is to be weakened, there will be a multi-billion dollar debt accumulated which will hit with full force in a few years when we have to make up again for lost time. Because costs of the ballistic missiles, coupled with other important programs, are rising. A rigid ceiling will not stem the cost rise, but merely postpone it for a day of reckoning, the pundits tell us.

Tremendous expenditures, hard thinking in certain military quarters, plus things like *Look* magazine's startling article on the "coming death of the manned air force," have convinced some influential people in the Air Force and Navy they've done an overselling job on ballistic missiles. They'll try to reverse the trend in public opinion before Congress reconvenes, and you'll be reading a lot from now on that manned planes coupled with missiles will be around for many years to come. The Army, however, is still plugging the missile, and hard.

AIRPORT OFFICIALS WONDER what's happened to the fiscal '59 federal aid airport program. They ask: Is Commerce Dept. dragging its feet? They remember that the four-year program was passed over Secretary Weeks' objections. CAA hasn't yet issued the call for '59 project requests.

By the time the program's firmed up, they fear bond sale programs will have been disrupted and some of the construction season lost. Airports are caught in a squeeze—Commerce on the one hand and, on the other, increasing difficulty noted by some communities in raising matching funds.

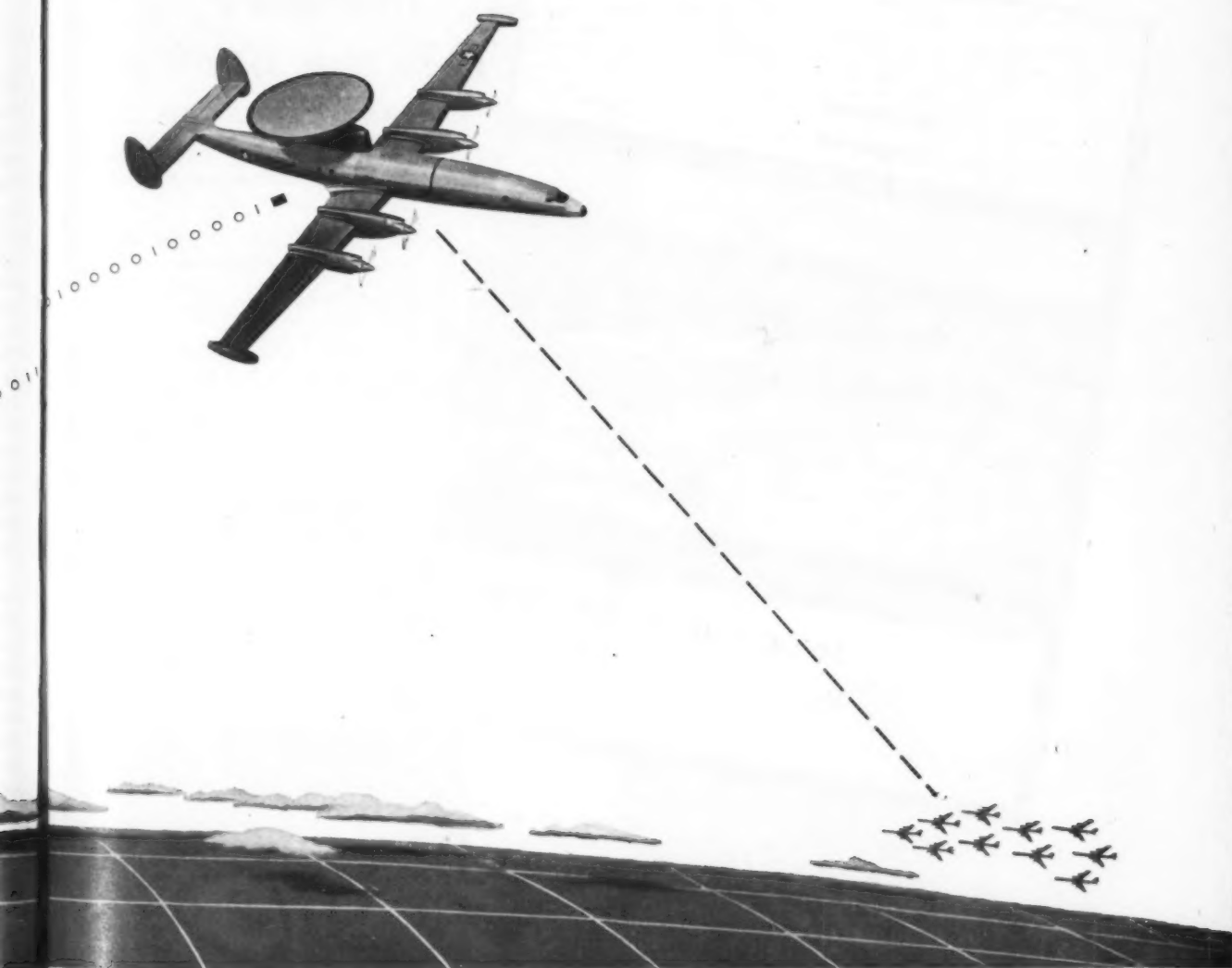
DOMESTIC AIRLINE EXECUTIVES are worrying about the day a year or so hence when the current fleets of piston-engined transports are put up for sale in the transition to turboprops and jets. From 1946 through 1956 the domestic industry sold a total of 66 post-war planes—DC-6s, Connies and Convairs, for example. But in the jet transition period American Airlines alone will offer three times as many planes for sale, including about 40 DC-7s, 80 DC-6s and 70 Convair 240s.

Add to this the fleets of the remaining carriers, both domestic and international, and the over-supply and low prices appear staggering to some of our air transport leaders. They disagree with some opinion in the aircraft manufacturing industry, that there will be a big need for this equipment.

Where will this need be? The Douglas and Constellation fleets are not adaptable to local service lines, which use many small airports. The locals are also embarking on re-equipment, with new planes. The non-scheduled field is uncertain, and those few non-skeds which are financially able are buying new aircraft. The all-cargo carriers likewise are buying new planes as needed, although they may form a small potential market for DC-6s. Foreign carriers, once a substantial market for used U.S. planes, are ordering new jet and turboprop equipment and will become suppliers instead of consumers when the re-equipment program gets under way. To complicate the situation for U.S. carriers, it's generally expected that the seller who gets best prices in a declining market is the one who sells first. And various foreign airlines, particularly the British, have a jump on U.S. carriers on delivery dates for turboprops and may get to dispose of their piston-engined fleets first.

All of this will not only reduce available funds to pay for jets but it is the reverse of a situation which has led folks like CAB and Internal Revenue Service to consider new and more stringent depreciation policies based on past profits from aircraft sold in an inflated market. Government and industry should get together on this latter trend and avoid a serious situation in less than two years from now.

The Staff



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AMERICAN AVIATION

LETTERS

More views on alcohol

To the Editor:

Trivial though the issue may seem, it appears about time that someone spoke for the forgotten man in aviation—the passenger.

Mr. Sayen of ALPA does little credit to his organization or the industry it serves in his letter appearing in your August 26 issue (p. 15).

He says "... we are wondering just exactly who is for the service of alcohol on board airplanes..." The answer is very simple—the customer. As a fairly regular user of the airlines (over 300,000 miles) I can testify that... a couple of drinks during a long day's flight are a welcome break and make the trip far more pleasant than it would otherwise be. I might also say that since I started riding the airlines in 1933, I have seen only one inconvenience caused by intoxication. That happened to be a case where the pilot allowed an already plastered customer to board the airplane, even though he had to be fed oxygen for a period of about four hours, making it impossible for the rest of the passengers to smoke during that time!

As to representing his organization, I would say that he had done less than a creditable job in presenting his case (if any) to the CAB. I believe most of us are quite content with the consistently good judgment exercised by CAB Vice

Chairman Chan Gurney and believe that he is giving authoritative testimony when he says that the Board has not received "an authentic account of a single incident in which the service of liquor aboard aircraft has adversely affected the safety of air carrier operations."

I feel certain that the vast majority of excellent pilots commanding our commercial aircraft are just as competent at handling their airplanes as we passengers are of handling the two modest drinks that the airlines are thoughtful enough to provide for the comfort of those who pay the pilots' salaries. ROBERT E. BATTLES, R. A. Rowan & Co., Los Angeles, Calif.

To the Editor:

Got quite a kick out of the repartee between Clarence Sayen and Ye Editor in the Aug. 26 issue of AMERICAN AVIATION (p. 15), concerning sale of liquor aboard aircraft.

Perhaps you may be interested in some remarks from the guy in-between—the passenger.

Last year, the writer and his wife flew from New York to London, non-stop, on a Pan American DC-7, leaving New York about 6 p.m. and arriving in London 10 hours later.

We purposely sought and succeeded in getting seats in the rear of the main cabin, feeling it would be quieter and we could get some sleep (we had not slept

at all the night before in the noisy hotel where we were obliged to stay on 46th near Broadway).

Unfortunately, these seats were directly opposite the galley where the lights remained on all night, and shone directly on us. They remained on principally because three passengers kept buying drinks in that area, and jabbered loudly all night long. Between serving dinner, drinks and breakfast in the morning for 60 people, the two stewardesses did not sit down once in the 10-hour flight. We arrived in London completely exhausted, and in a helluva condition to start our European vacation.

Now I ask anybody which is better—to deny three persons drinks they could probably do well without, or discommode 57 people?

Also, doesn't it detract considerably from the dignity of the stewardess' job (yes, and the availability in the future of such a fine group of girls as we have had in this service in the past) by making barmaids out of them? W. G. RYBERG, 75 Fernwood Drive, San Francisco.

Liked Beller's article

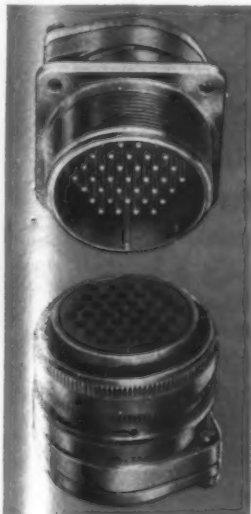
To the Editor:

We all feel Bill Beller's article on Specialty Heating Products in the August 12, 1957 issue was a good one. He succeeded in giving a comprehensive view of a rather difficult and abstruse product line.

Last week while at WESCON, San Francisco, we met some people who had read the article and recalled it without being asked. C. C. CROSS, Specialist-Product Information, General Electric Co.

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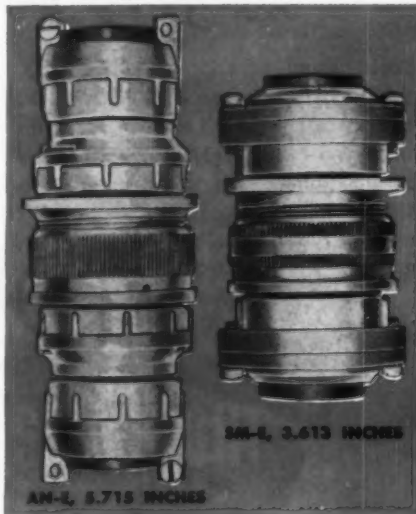


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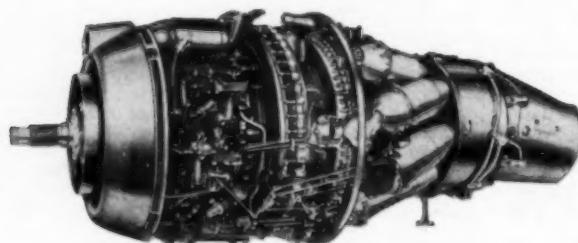
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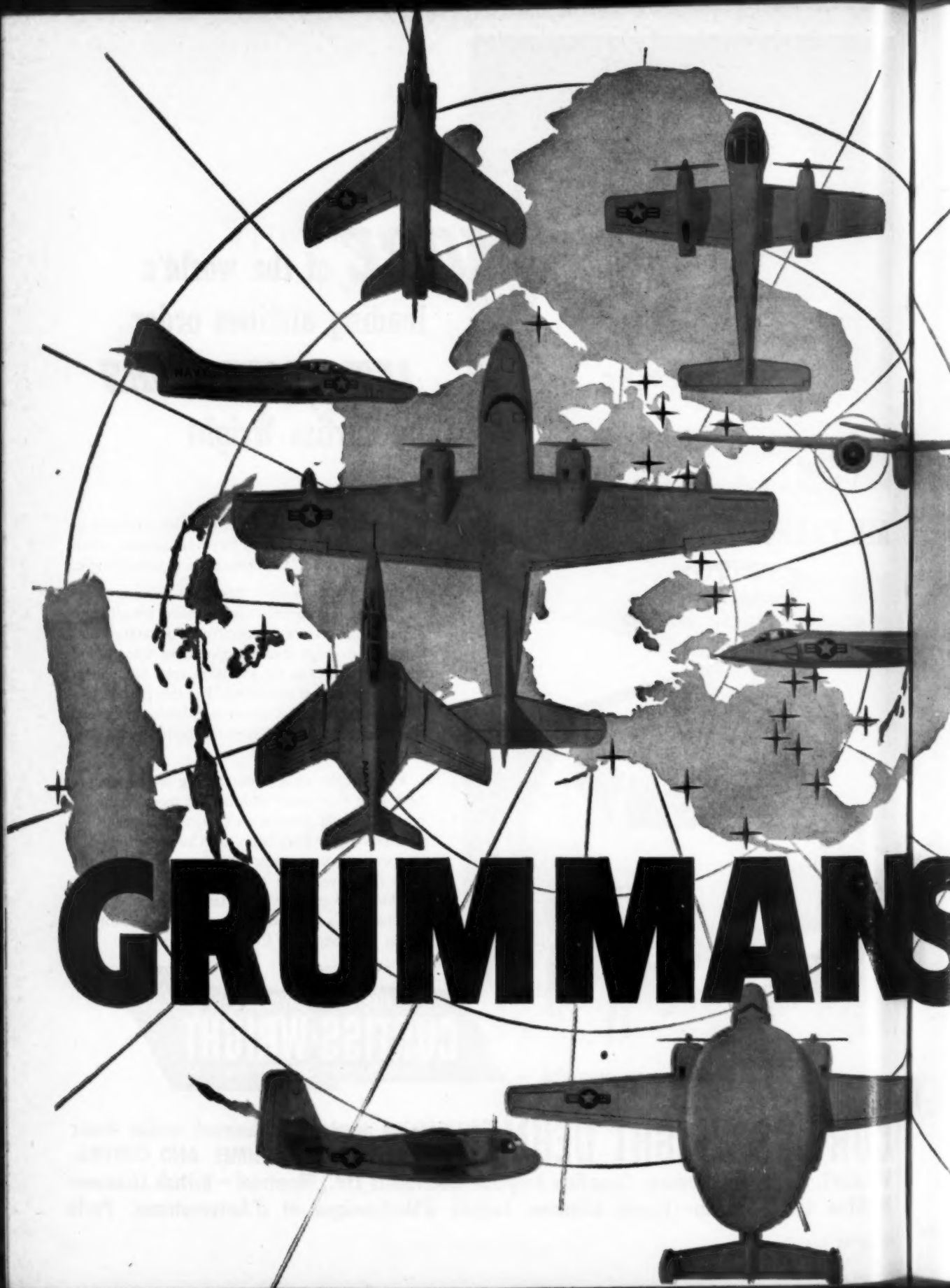
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SPOTLIGHT

Air Force Thor IRBM covered 1,350 miles in its first successful flight last month following malfunctions on four previous firings. Operation of the propulsion system and telemetry was described as excellent.

USAF has been chosen to handle development of Army's 250-hp turboshaft engine. Invitations to submit design proposals on the project are expected in the very near future.

Navy's new Temco XKDT-1 rocket-propelled target plane (AMERICAN AVIATION Sept. 26, p. 32) has been named the Teal. The drone is powered by a Phillips Petroleum Co.-developed solid rocket, which Phillips says solved these problems: flight duration of more than eight minutes, same rocket for initial boost and subsequent sustained thrust, heat control to prevent damage to electronics and parts, light weight.

Stavid Engineering, Inc., Plainfield, N. J., has a study contract from USAF Cambridge Research Center to investigate and evaluate advanced systems of electronics display of air traffic control information. Work includes evaluation of all types of cathode ray tubes, including flat transparent phosphor units.

Vickers VC-10 jet transport still is shrouded in mystery, but indications are the engines will be located rearward. Some form of boundary layer control also will be used.

Martin Co.'s order for \$1 million in equipment from General Precision Laboratory Inc. was for APN-66 Doppler navigator for use on the P6M SeaMaster. Application is believed to be a tie-in with an advanced bombing-navigation system Navy is developing for long-range bombing capability of the flying boat.

Army's plans to award a development contract for a three-ton turbine-powered helicopter this fiscal year may have to be revised. No design competition has been ordered for the machine although three months of the fiscal year already have elapsed. One snag is lack of agreement with USAF and Navy on a joint requirement; another is the delay in Pentagon apportionment of funds.

Safe Flight Instrument Corp. has delivered its 40,000th stall warning detector. The Safe Flight detector is standard equipment on Cessna, Beech, Aero Design and Mooney aircraft, and is being used by seven airlines.

CAA is commissioning VHF automatic direction finders for use with Bendix ASR-3 radars. Twenty units were commissioned in the last three months, 40 more will be installed as radars go in. System aids controller in identifying aircraft by keying voice transmission signals with blips on radar screen. Voice causes pencil beam to pass through blip.

Grumman has named three distributors as sales and service agencies for its Gulfstream executive turboprop: Atlantic Aviation Service, Inc., Philadelphia, East Coast; Remmert-Werner Corp., St. Louis, Midwest, and Pacific Airmotive Corp., Burbank, Calif., West Coast. Transport is being offered for 1959 delivery.

Ryan Aeronautical Co. has a new Model 108 Doppler navigator that is even lighter than its Model 103 built for Army. Older model was lightest weight system available giving ground speed, drift angle, latitude and longitude, course and distance to destination. New unit, being tested on an L-20 Beaver, operates up to 25,000 ft. altitude.

Rolls-Royce is offering a production 2,955-ehp version of the Dart RDa10 for delivery in spring of 1961. In April 1959, production RDa10s rated at 2,590 ehp will be available.

Goodyear Aircraft's Inflatoplane pictured in AMERICAN AVIATION, Sept. 23, p. 69, is a tractor, not pusher prop installation. Actually, prop was not installed during tests in question; wing contacted engine mount in incident reported.

ENGINEERS

... CROSS NEW

frontiers in system
electronics at THE

GARRETT CORPORATION

Increased activity in the design and production of system electronics has created openings for engineers in the following areas:

ELECTRONIC AND AIR DATA

SYSTEMS Required are men of project engineering capabilities. Also required are development and design engineers with specialized experience in servo-mechanisms, circuit and analog computer design utilizing vacuum tubes, transistors, and magnetic amplifiers.

SERVO-MECHANISMS

AND ELECTRO-MAGNETICS Complete working knowledge of electro-magnetic theory and familiarity with materials and methods employed in the design of magnetic amplifiers is required.

FLIGHT INSTRUMENTS AND TRANSDUCER DEVELOPMENT

Requires engineers capable of analyzing performance during preliminary design and able to prepare proposals and reports.

FLIGHT INSTRUMENTS

DESIGN Requires engineers skilled with the drafting and design of light mechanisms for production in which low friction, freedom from vibration effects and compensation of thermo expansion are important.

HIGH FREQUENCY MOTORS,

GENERATORS, CONTROLS Requires electrical design engineers with BSEE or equivalent interested in high frequency motors, generators and associated controls.

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AMERICAN AVIATION

OCTO

Electronic Cooling Package...by AiResearch



SPECIFICATIONS OF TYPICAL AIRESEARCH COOLING PACKAGE

Air Flow	60 CFM
Fan Air Inlet Pressure	18 PSIA
Fan Pressure Rise	1.2 inches water
Heat Exchanger Pressure Drop	1.0 inches water
Liquid	Water
	Methanol
	(70% Methanol)
Liquid Flow	0.4 GPM
Heat Rejection*	300 Watts
Fan Power	30 Watts, 110 V., single phase, 400 cycle
Package envelope dimensions	7 x 6 x 3 inches
Package wet weight	2.5 lbs.

*Assumes Class A (85°C.) electronic components, liquid inlet temperature to heat exchanger, 55°C. Includes heat from fan motor.

This high performance AiResearch package cools sealed and pressurized electronic equipment. The fan circulates air through the liquid cooled heat exchanger and over electronic components in a hermetically sealed module. Air cooled units are also available. Fan and heat exchanger are designed, built and packaged by AiResearch for matched performance. Package size is tailored to your individual cooling requirements.

The Garrett Corporation, through its AiResearch Manufacturing divisions, is an industry leader in components and cooling systems for aircraft, missiles and nuclear applications. This wide experience is now being offered to the electronics industry to provide a cooling package to meet any cooling requirement. Send us details of your problem or contact the nearest Airsupply or Aero Engineering office for further information.



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OCTOBER 7, 1957

Circle No. 8 on Reader Service Card.

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serviceman
hangs his hat



From Coast to Coast watch for this Crest of good living when you travel. For business men and for Gov't personnel it represents the top in service.

In Washington it's

The Hotel RALEIGH

Close to all transportation. Pentagon buses across the Street. Within walking distance of many other Government buildings.

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HOTEL WILTON

Honolulu, Hawaii
HOTEL WAIKIKI BILTMORE



WHEN — WHERE

OCTOBER

- National Electronics Conference and Forum** on electrical research, development and application, Hotel Sherman, Chicago, Oct. 7-9.
- Triennial Inspection of the NACA Lewis Propulsion Lab.**, Cleveland, Oct. 7-10.
- International Astronautical Federation**, annual congress, Barcelona, Oct. 7-12.
- Annual Airport Development and Operations Conference** sponsored by N. Y. State Bureau of Aviation, Onondaga Hotel, Syracuse, Oct. 8.
- International Union of Aviation Insurers**, annual general meeting, Amsterdam, Holland, Oct. 8-11.
- Society for Experimental Stress Analysis** national fall convention, El Cortez Hotel, San Diego, Oct. 9-11.
- National Noise Abatement Symposium**, Armour Research Foundation, Sherman Hotel, Chicago, Oct. 10-11.
- ASTA convention and world travel congress**, Madrid, Spain, Oct. 13-20.
- National Assn. of State Aviation Officials**, annual meeting, Sun Valley, Ida., Oct. 16-18.
- Canadian IRE Convention-Exposition**, Automotive Bldg., Exhibition Park, Toronto, Oct. 16-18.
- The Magnesium Association**, annual convention, Biltmore Hotel, New York, Oct. 17-18.
- National Society of Professional Engineers**, fall meeting, Grand Pacific Hotel, Bismarck, N. D., Oct. 17-19.
- American Helicopter Society**, annual western forum, Statler Hotel, St. Louis, Oct. 20-22.
- IRE national symposium on engineering writing and speech**, Sheraton-McAlpin Hotel, New York, Oct. 21-22.
- IAS meeting, Canadian Aeronautical Institute**, Montreal, Oct. 21-22.
- Computer applications symposium**, Armour Research Foundation, Harrison Hotel, Chicago, Oct. 24-25.
- Aircraft Electrical Society aviation display**, (invit. only), Pan Pacific Auditorium, Los Angeles, Oct. 24-25.
- Association of the U.S. Army**, annual meeting, Sheraton-Park Hotel, Washington, Oct. 28-29.
- East coast conference on aeronautical and navigational electronics**, IRE, Fifth Regiment Armory, Baltimore, Oct. 28-30.
- American Nuclear Society**, second winter meeting, Henry Hudson Hotel, New York, Oct. 28-31.
- Aviation Electrical Equipment Display**, U.S. Grant Hotel, San Diego, Oct. 30.
- Air Traffic Control Association**, annual meeting, Marrott Hotel, Indianapolis, Oct. 30-Nov. 1.

NOVEMBER

- World Metallurgical Congress and National Metal Exposition**, Palmer House, Hotel Sherman, International Amphitheatre, Chicago, Nov. 2-8.
- Institute on Electronics in Management**, (automatic data processing systems), The American University, Washington, D. C., Nov. 4-8.
- Joint military-industry guided missile reliability symposium**, Naval Air Missile Test Center, Pt. Mugu, Calif., (limited to those with secret security clearance), Nov. 5-7.
- Third Aeronautical-Communications Symposium**, IRE-PGCS, Utica, N.Y., Nov. 6-8.

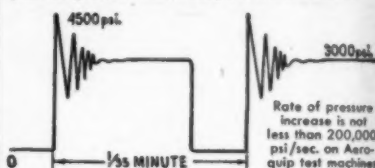
Aeroquip Engineering Notes



B. A. MAIN, JR.

The advertisement at the right reveals a new construction for high pressure hose of Teflon. Naturally there is a reason for going to this type of construction and I'll try to show here why we did it.

The most widely used measuring stick for evaluating high pressure hose is the impulse test. In this test, the hose line is subjected to hydraulic impulse pressure varying from 0 pressure to 3000 psi, with a surge peak pressure which reaches 4500 psi. The pressure curve shape is shown below:



A hose line is considered adequate if it will withstand 100,000 cycles or applications of this pressure curve, and in the case of hose of Teflon, the fluid in the hose and the ambient air surrounding it must be held at 400° F.

We began this development by building and testing hoses using conventional two-wire braided reinforcement around the inner tube of Teflon. In the -4 size, two wire braids proved to be adequate reinforcement to withstand the impulse test, each time samples were tested.

In the -6 size, we tested many constructions of two-wire braided hose of Teflon. We explored both 302 and 304 stainless steel wire in sizes from .011" to .015" diameter. We also explored the use of carbon steel wire for the inner braid using various wire sizes. Twelve separate impulse tests involving hundreds of samples were necessary to investigate all combinations; in every case one or more samples failed before completing the 100,000 cycles of impulse. Our experience with the -8 size paralleled that with the -6 size.

The failures always begin with the inner braid. Here, individual wires break at the crossovers which are formed when wires are first brought over and then under other wires in braiding. As soon as a sufficient number of the individual wires break, the hose bursts during the test.

The obvious solution to this problem was to eliminate the crossovers of braiding by substituting the two spiral wire wraps for the inner braid. This required new machinery and techniques, but we now produce the hose successfully.

We have now finished six separate impulse test successfully on the -6 and -8 sizes. The samples tested have included both carbon steel wire and stainless steel wire for the spiral wraps and both wires passed the 100,000 cycles every time.

Work on this project has convinced me that it is impossible to build a braided hose size -6 and larger which will withstand this impulse test every time the hose might be subjected to the test.

In our tests of the -6 size we did have two successful tests of braided hose, but when these were retested the samples failed, so you can't judge by one test alone.

The spiral construction provides the best high pressure hose available today. It can be used at the same bend radii as equivalent two-wire braided hose, and compares nearly exactly in weight and size.

B. A. Main Jr.

VICE PRESIDENT, ENGINEERING
AEROQUIP CORPORATION

AMERICAN AVIATION

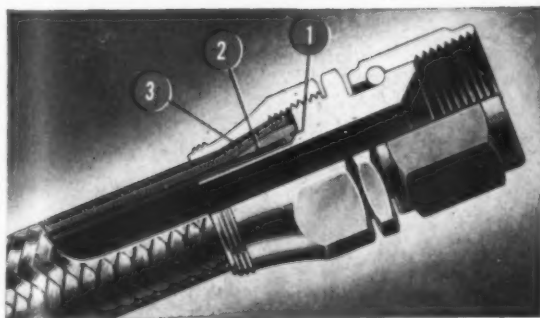
SPIRAL WRAP adds lasting strength

Stainless steel wire is closely wrapped at a precise angle to form a smooth reinforcement layer. This prevents brinelling of the tube, eliminates wire stress concentration common in braided reinforcement and provides optimum strength and flexibility. Outer cover is stainless steel wire braid. Tube of Teflon is distinctive Aeroquip red.



Specify Aeroquip 677 Hose of TEFLON* and Reusable "super gem" Fittings for 3000 psi. Systems

GET ALL THESE IMPORTANT ADVANTAGES:



Leakproof, too! This cutaway view shows how Aeroquip "super gem" Fittings protect against leakage at all pressures: (1) a metal-to-metal line seal; (2) a lip seal formed by the tube of Teflon seated, but not compressed, between the nipple and sleeve. Compression of wire reinforcement (3) assures positive grip and lasting protection against fitting blow-off.

*DuPont trade name for its tetrafluoroethylene resin.
"super gem" is an Aeroquip Trademark.

Hose Strength that lasts and lasts! The secret is in the hose construction perfected by Aeroquip . . . multiple spiral wrap reinforcement that resists impulse fatigue and prolongs the life of the hose line.

Reusable "super gem" Fittings that cut costs! Fittings are often the most expensive part of a hose line, well worth saving when engineering or production changes call for fluid line alterations. With "super gem" Fittings you save ALL, not part, of the fittings. Hose line assembly and disassembly is quick and easy, using ordinary bench tools.

High performance, high temperature hose lines of Teflon especially designed for 3000 psi. aircraft systems by the leading producer of hose lines for aircraft applications. Mail the coupon below for complete information.

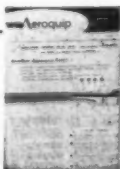
Aeroquip Corporation, Jackson, Michigan
Western Division, Burbank, California
Aeroquip (Canada) Ltd., Toronto 10, Ontario

Aeroquip

REG. TRADEMARK

Aeroquip Corporation, Jackson, Michigan
Gentlemen:

Please send me engineering bulletin AEB-16
with complete information on Aeroquip 677
Hose of Teflon and "super gem" Fittings.



Name _____ AMA-18
Title _____
Company _____
Address _____
City _____ Zone _____ State _____



Bill Remmert brought R-W services to Pompano. Behind him, a DC-3 conversion nears completion.



Bob Werner works most of his time at Remmert-Werner's home-base operation in St. Louis.

Remmert-Werner... Big-Change Artists

*Over 200 aircraft conversions . . .
thousands of corporate planes maintained
and serviced . . . millions of gallons of Shell
Aviation Fuel sold to satisfied customers—
that's Remmert-Werner's 10-year record!*

In June '56, a caravan of three giant mobile units left Remmert-Werner's home base, Lambert-St. Louis Municipal Airport. It was headed for Pompano, Florida.

Bill Remmert met the caravan. Utilizing its complete machine, woodworking, and electrical shops plus radio racks, stockroom and expert mechanics, he established another R-W-staffed base.

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"When we took over the Pompano field," recalls Bill, "we needed fueling equipment—fast. Shell engineers came down and designed our bulk plant. And almost before we knew it, there were the three 15,000-gallon storage tanks we ordered waiting out there on flatcars, ready to go. Shell helped us zoom into business."

Besides servicing a good number of America's 28,000 corporate planes, Remmert-Werner also converts surplus commercial and military aircraft into luxury planes for private owners and corporations.

In an ordinary conversion job, R-W rips out every bit of wiring and piping, and installs completely new systems to customer specification. Lounge chairs and sofas, tables, lamps, galleys and any other special furnishings are designed and built by R-W craftsmen.

Among the organizations that happily fly Remmert-Werner conversions are Olin Mathieson Chemical, Grumman Aircraft, Hercules Powder and Owens-Illinois Glass.

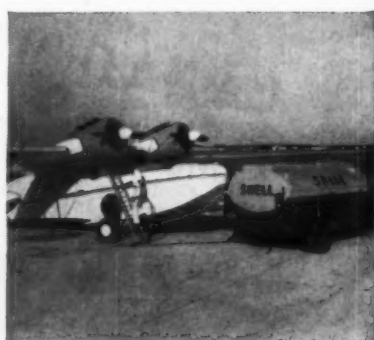
"It didn't take long for us to find out that when you're a Shell Dealer, business flies your way," says Bill. "Shell works right along with you, helping you build your business. They've even helped us locate old DC-3's when they've been hard to

get. A Shell man spotted some while traveling in Turkey last year. We went right over there and bought them. Most of those '3's' have already been converted into flying yachts."

If their first 16 months at Pompano is any indication, Bill Remmert and Bob Werner are on their way to making R-W service available to America's ever-increasing fleet of corporate aircraft.



Before: C. S. Weaks (right), R-W sales manager, and client discuss plans for a Grumman "Goose."



After: R-W serviceman fuels a converted "Goose" with Shell Aviation Gasoline.



Before: R-W craftsmen remodel interior of DC-3. They'll install new wiring, insulation, picture windows, and furnishings to order.



After: Betty Remmert (right) shows prospective client through completed interior. R-W conversions sell for as much as \$300,000.

It pays to be a Shell Aviation Dealer

--and the Shell office nearest you will be glad to show you why



B

eginning a dramatic new chapter in the story of CANADAIR

CANADAIR CL-44

Canada's impressive new
turbo-prop aircraft



The CL-44, the Royal Canadian Air Force's newest strategic transport aircraft, is now in full scale production at Canadair. The CL-44 is available in commercial cargo and passenger versions for delivery in 1960.

Canadair invites enquiries: Please contact Karl H. Larsson, Manager Commercial Aircraft Sales.

A proved Combination

The CL-44, both military and civil, is a developed version of the Bristol "Britannia". It offers users a triple combination: the ultimate development of a thoroughly tested parent, American standardization, and the efficiency-speed advantages of the foremost turbo-prop engines. As a result, the CL-44 promises to be an economical, flexible and practical transport for long and medium hauls.

World Wide Use Likely

Because the CL-44 is designed for future transport requirements, its development is being closely watched by many airlines, freight carriers and air forces.



CANADAIR

LIMITED, MONTREAL, CANADA

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CANADAIR IS A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION

OCTO

AIRTRENDS

The WS-110 chemical bomber has been assigned USAF's top development priority in the category of manned air weapon systems, followed by the long-range interceptor. Formal evaluation of the Boeing and North American WS-110 designs is expected by year's end, but it's not clear whether USAF will be able to award a Phase I development contract before next fiscal year. USAF originally requested \$24 million for the WS-110 for the current year.

The Holaday-Schriever-Medaris committee raced against time last week to complete technical recommendations for merger of the USAF Thor and Army Jupiter IRBM projects. With the report already two weeks overdue, the committee hoped to wind up the job and have the results in the hands of Defense Secretary Charles Wilson before his departure from the Pentagon early this week. Although there was no hint of what the three-man technical group would propose, there was plenty of unofficial advice available. Latest was an editorial blast from *Air Force* magazine which charged that a decision favoring the Jupiter would delay an operational IRBM by at least 18 months.

Recent Pentagon estimates of this fiscal year's spending for aircraft and missiles have jumped sharply over the forecasts of last January, despite the wave of cutbacks and stretchouts ordered to curb military expenditures (see page 29). Yet the overall ceiling of \$38 billion still stands for military spending this year.

Military budgeteers expect the services will lay out \$7.2 billion for aircraft and \$2.5 billion for missiles during fiscal 1958, compared with a January guess of \$6.7 billion and \$2 billion, respectively. The increases may seem paradoxical, but consider actual fiscal 1957 outlays: \$7.9 billion for aircraft and \$2.1 billion for missiles. It is these rates of expenditures which the services are trying to bring under control. The budgeteers are rolling back expenditures in both accounts (with more emphasis on aircraft than on missiles) despite any evidence to the contrary which the new estimates would seem to provide.

House investigators are quietly collecting data on the U.S. missile effort. Basis of the probe by the Military Operations Subcommittee is to ferret out examples of waste and duplication. But observers are betting that the military will be called upon to explain the cancellation of the Navaho. Chairman of the subcommittee is Democrat Chet Holifield of California—the state where the missile was being developed.

Impact of sweeping defense cutbacks on smaller firms and subcontractors may undergo scrutiny in the coming session of Congress. A special House small business subcommittee on aircraft has been directed to launch a probe and hold hearings. Similar intentions were proclaimed earlier this year, but nothing official developed.

Air Force Secretary James Douglas had some bad news for Military Air Transport Service in a recent speech: no jet transports have been ordered for MATS and none are contemplated. High MATS officials have been campaigning for jet transports for many months on the grounds that the aircraft are essential to rapid troop movements in time of war. But Douglas said MATS will be able to meet its transport requirement with its new C-130 and C-133 turboprops together with the jet transports of the Civil Reserve Air Fleet.

DIGEST

Too much emphasis being placed on ballistic missiles, says Gen. Cook, president of Aircraft Industries Assn.

Aircraft Industries Assn. has charged that the public has been fed an "overdose of ballistic missiles." Missile weaponry does not start and stop with ballistic missiles.

"Certainly," Gen. Orval Cook, (USAF-Ret.), head of AIA, said, "we must and will develop successful long-range ballistic missiles." But, he added, "there are many missiles for many purposes, just as there are many airplanes for many missions."

"Our capabilities," Cook declared, "of striking with nuclear force from our many advanced bases, from ships and subs at sea and from long-range aircraft approaching enemy targets are even more important to us now than the prospect of IRBMs and ICBMs several years hence. And I am not so sure they won't be just as important when the ballistic missiles are operational."

He urged that the role of the big missiles be brought more into perspective. Firstly, he noted, it is highly unlikely that either the U.S. or USSR will have such weapons perfected and operational for several years to come. Secondly, the ICBM is not the absolute or ultimate weapon since a defense technique can be developed and a number of companies are already working on an anti-missile missile.

Generally, he observed, guided missiles will play an increasingly great part in American air combat potential, but they will not replace all manned aircraft. "I belong to a school which believes we can never entirely substitute electronic wizardry for human judgment . . . War has always been a succession of measures and counter measures, and if counter measures are successful, we must have the judgment of a strong manned force on which to fall back."

The ultimate role of the guided missile is "quite a few years away," he said. Air Force estimates indicate that 90% of all air defense will be handled by missiles. Strategic Air Command will have 50% missiles, while Tactical Air Command will have 30% missiles. Navy expects 35 to 40% of its total airpower spending to be for missiles within five years.

Aircraft industry, the retired general observed, has a big stake in both fields. He defined a missile as an "aircraft which substitutes electronic or other devices for the pilot." Both research and production techniques are similar for the two weapons, he noted, using the same windtunnels, computing

equipment, materials, fabrication and tooling.

The industry presently holds 24 prime contracts for airframe, powerplant and/or guidance for the 33 known missile programs, excluding highly classified and research missile projects, Cook revealed. "It is also pertinent to note," he added, "that 144 companies are engaged in producing these various elements, and that of these 144 (there are, of course, duplications), 110 are in the aircraft industry."

Cook's remarks were made at the premiere of an AIA produced film titled "Men and Missiles" which will be made available to television stations as a public service.

CAA certifies Allison 501-D13 turboprop

Allison Division, General Motors Corp. has received CAA certification of its Model 501-D13 turboprop engine clearing the path for civil use on Lock-

heed Electra transports in 1958.

The Model D13, rated at 3,750 horsepower, is the second Allison turboprop approved by CAA. Its predecessor, the 501-D10, was certificated in May, 1955 at the same rating.

Principal changes in the D13 include a relocated engine inlet air duct from below to above the reduction gear assembly; use of a four-piece instead of one-piece compressor housing, and introduction of a revised compressor air-bleed system for low-idle (10,000 rpm) operation on the ground.

The D13 also incorporates increased strength turbine wheels and a torque sensing system which will provide automatic propeller feathering in event of engine failure during takeoff.

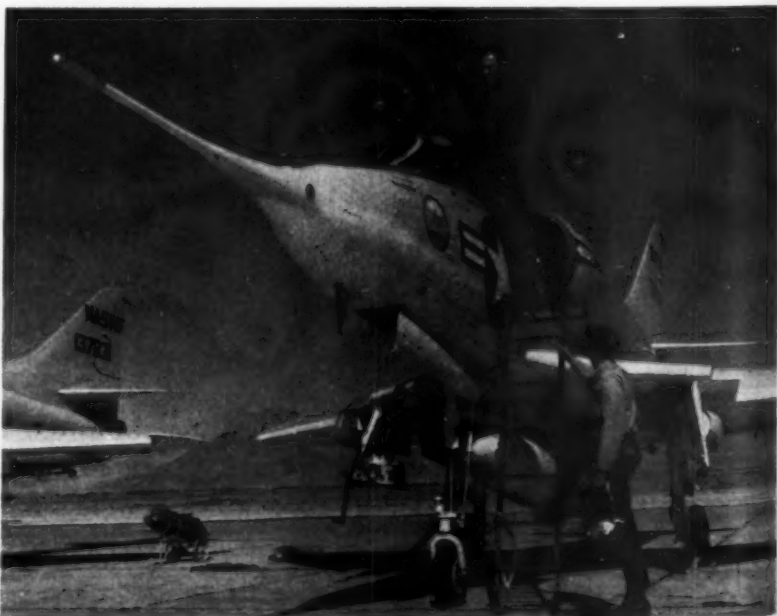
Air Force increases order for Convair B-58s

USAF has decided to increase its order for the supersonic Convair B-58 bomber, Gen. Thomas White, USAF Chief of Staff, disclosed. He did not reveal how many additional planes were ordered.

"It has a radical design but the test results have proved so satisfactory that we are now ordering more Hustlers than we originally considered," he said. The B-58 is in limited production and will replace the Boeing B-47 medium bomber, he added.

USAF originally ordered 13 B-58s and was scheduled to order another 17 during the current fiscal year for accelerated testing.

Skyhawk goes through nuclear attack tests



READY FOR OPERATION PLUMBBOB. Cmdr. Stanley Montunna receives helmet from his plane captain, D. J. Page, before taking off to test effects of atomic blasts on specially-instrumented Douglas A4D-1. Montunna commanded a Navy unit that flew in close to Nevada A-blasts to determine explosion and thermal responses of carrier-based aircraft to nuclear attack conditions.

Airways Modernization Board invites 40 companies to bid on traffic control, data processing equipment

About 40 electronics firms have been asked to bid on one of the top priority projects scheduled by the Airways Modernization Board: construction of air traffic control, data-processing and display equipment AMB expects to use for study leading to construction of an experimental ATC system.

Deadline for bids is Nov. 30, and contract award is expected by Jan. 1. AMB will spend the first year in developing a breadboard model of a "significant segment of the ATC system," according to James L. Anast, Acting Technical Director, AMB.

The New York CAA Center has been tentatively selected for first trials of the system sometime in 1959. In the interim tests will be done by simulation and occasional spot checks with live aircraft.

First full-scale service tests are expected in 1960 and will continue until 1961 at which time installation for actual use in the New York area will begin. SAGE air defense system will be tied into the tests.

Four other major programs revealed by Anast to have top priority in AMB planning are airports, communications, radar data processing and navigation.

Airport configuration research calls for analysis and flight tests over the next 12 months in connection with design of high-speed turnoffs and lighting. This program will be expanded into research on parallel runways, parallel short runways for low-performance aircraft bypass strips, and optimum locations and configuration of adjacent airports.

One AMB project on airport location is already under way and a contract was awarded to study site selection for a second Washington, D. C. airport. Contract was for less than \$100,000.

Work will be done as joint venture of Greiner-Mattern Associates, Baltimore, Md. Mattern is a member of the firm of Hayes, Seay, Mattern and Mattern, Roanoke, Va. Greiner-Mattern will have help from these other firms and organizations: Landrum and Brown Airport Consultants, Cincinnati; Aeronautical Research Foundation; Airborne Instruments Laboratory; Cornell Aeronautical Laboratory. A report is due on Dec. 28.

Location of the airport is expected to be narrowed down to two or three sites. AMB will then hold public hearings to get information on expected impact of the airport on nearby communities.

Programs of AMB will be carried out by these four line organizations following recommendations made by the Curtis Committee:

Operations Analysis Branch—scientific analysis of current facilities operations.

Systems Analysis Branch—theoretical analysis of new and proposed systems.

Systems Experimentation Branch—planning and direction of system experimentation in an experimental facility to be set up, and at other places.

Component Development Branch—provides technical experts for R&D, directs contractual effort for equipment, continual survey of R&D in AMB with special attention to Department of Defense.

Primary goal of AMB is to achieve a significant increase in aviation's operation capability from 1958 to 1963. First project toward this end is the data-processing and display program.

Second aim is to establish a working force and facilities for the expected joint civil-military Federal Aviation Agency. E. R. Quesada, AMB chairman, is carrying out studies preparatory to making legislative recommendations for FAA.

Curtiss-Wright buys rights to build, sell Iroquois

Curtiss-Wright Corp. has signed an agreement with Orenda Engines Ltd. covering the rights for the manufacture, sale and further development of the Canadian company's Iroquois engine for a seven-year period. The agreement also provides for the exchange of tech-

nical information between the two companies.

Roy T. Hurley, president of Curtiss-Wright, commented that "this agreement makes available to U.S. military forces a high Mach number engine for all purposes three years ahead of schedules."

The Canadian engine was developed by Orenda for the RCAF's Avro CF-105 Arrow supersonic fighter. W. R. McLachlan, president of Orenda, said "it is anticipated that the two companies will collaborate in the development of further variants of the Iroquois suitable for the very high speed, high-altitude interceptors and bombers now on the drawing board, and for commercial applications."

The Iroquois' thrust is classified but has been reported as being well over 20,000 lbs. The engine has a 5-1 thrust/weight ratio.

Lockheed seeks reversal of excess profits finding

Lockheed Aircraft Corp. has asked U.S. Tax Court to set aside a Renegotiation Board finding that it earned \$6 million in excess profits in 1953. The board ordered Lockheed to refund \$4,254,978 to the government after giving credit for state tax payments.

Lockheeds' total renegotiable sales amounted to \$762,766,000 in 1953, an increase of 96.6% over renegotiable sales the year before, according to the board. Its profits on renegotiable business in 1953 were \$52,724,000, up 196.2% over 1952.

New Defense chief visits West Coast plants



NEIL H. McELROY (left), recently appointed to succeed Charles E. Wilson as Secretary of Defense, is shown being greeted by Donald W. Douglas (right), president, and Donald W. Douglas, Jr., vice president, of Douglas Aircraft Co. on his swing through Southern California defense industry plants prior to taking over his new duties.

BRIEFS

Manufacturing—military

Maj. Gen. Hamilton H. Howze, Director of Army Aviation, has been assigned to U. S. Eighth Army Headquarters in Korea. Succeeding Howze will be Brig. Gen. Ernest F. Esterbrook.

Vertol's Model 76 tilt-wing VTOL hopped off the ground for an instant during engine run-up tests last month, but first actual hovering flight is still to come. First flights also are imminent for Vertol's T58- and T53-powered H-21 helicopters.

Coleman Engineering Co. has delivered the first commercial model of its Cole-Vac airfield vacuum cleaner to Boeing Airplane Co. Freuhauf Trailer Co., which is handling manufacturing and sales, is currently bidding on 23 service test units for USAF and Navy.

Lycoming Division of Avco Mfg. Corp. reports its 250-hp O-435-23A powerplant has set a new helicopter engine endurance record. The engine operated 750 continuous hours during a helicopter tie-down test at Hiller Helicopters, Palo Alto, Calif.

U.S. aircraft industry during July shipped 2,086,000 lbs. of complete civil aircraft, CAA and the Bureau of the Census reported. Shipments totaled 515 planes valued at \$70.5 million. Unfilled orders for planes weighing 3,000 lbs. or more amounted to 854 at the end of July, 16% under a year ago.

Grumman Aircraft Engineering Corp. has announced that about 500 employees will be laid off within the next few weeks. All major departments of the company are affected.

Three chemical companies have formed a concern called AFN, Inc., to develop a process for manufacture of boron-based high-energy fuels for the Air Force. The new company is jointly owned by American Potash & Chemical Corp., Food Machinery & Chemical Corp. and National Distillers & Chemical Corp.

Thomas L. Grace, former president of Slick Airways and more recently with Lopez-Grace, Inc., has been elected executive vice president of American Airmotive Corp.

Topp Manufacturing Co., division of Topp Industries, Inc., has established a Communications Division to work on design and manufacture of communication and navigation devices for aircraft as well as commercial ground station traffic control equipment.

A Lockheed X-7 ramjet missile has set three new speed records on its 10th flight at Air Force Missile Development Center, Alamogordo, N. M. Records include fastest speed for any ramjet missile, fastest speed for any ground-controlled missile, fastest speed for any recoverable missile.

Col. Benjamin G. Holzman has been named director of research at Air Research and Development Command, Baltimore, succeeding Col. L. B. Wil-

liams. Col. Holzman will supervise the research effort at all ARDC centers, including Office of Scientific Research.

Bendix Radio Corp. will have a prototype of its civil Doppler navigator in 18 months, according to Howard K. Morgan, company director of commercial aviation systems.

Northrop Aircraft, Inc. has received a \$20,892,688 contract from Air Materiel Command for modification of F-89D fighter-interceptors to F-89J interceptors.

Edgar Schmued, vice president-technical for Northrop Aircraft, Inc., will resign full-time management duties with the company Oct. 15 to establish his own research and development firm. The firm will enter into a consulting agreement with Northrop.

Consolidated Diesel Electric Corp. has developed a wheel-mover to taxi large aircraft to and from the loading gates of airports. System contains a hydraulic motor connected to a shoe which supplies moving power through the rim of the aircraft wheel. Boeing 707 will be used for tests.

Northwest Airlines has completed the sale of its four 1049G Super Constellations to Linea Aeropostal Venezolana. Sale was made as part of Northwest's re-equipment program, to assist in financing new DC-7Cs and DC-6Bs, and to reduce number of equipment types.

Transport

Capital Airlines has appointed Kenyon & Eckhardt as its advertising agency, replacing Lewis Edwin Ryan, Washington. Ryan has done an "excellent job," but Capital needs representation "by one agency throughout the entire area of our route system and Kenyon & Eckhardt' regional office locations fit this pattern ideally." Capital president David H. Baker said.

Continental Air Lines will start construction soon of a \$250,000 plant near Denver's Stapleton Airfield for maintenance of the 15 Viscounts it has on order. Building will be completed by Dec. 1.

John L. Weller has resigned as TWA's vice president-planning and program coordinator to accept a "chal-

lenging opportunity" with another organization.

J. S. Anderson, president of Aeronautical Radio Inc., was elected chairman of the Radio Technical Commission for Aeronautics, succeeding Dr. J. H. Dellinger, who held post 17 years.

George R. Petty Jr. was elected president of Flight Engineers International Association, succeeding William D. Kent, who is retiring on advice of his physician after seven years as head of the union. FEIA said Petty, 28, is the youngest president of any international union affiliated with AFL-CIO. He has been vice president-engineering of FEIA since last February.

Jugoslavenski Aerotransport, Yugoslavian airline, ordered two 64-passenger DC-6Bs from Douglas for delivery in late 1958. Price was \$1.5 million per plane, exclusive of spares.

Cessna's first 620 executive transport prototype is undergoing flight tests for CAA certification under Part 4b. Second of the four-engine prototype is undergoing static testing.

Financial

Capital Airlines had a \$777,179 operating profit in the first eight months of 1957, but interest charges of \$2,561,221 resulted in net loss of \$1,320,168. In the same 1956 period, operating loss was \$2,280,851, interest \$832,173 and net loss \$2,408,483. In August 1957, net loss was \$23,655 against a \$388,630 loss in the same month last year.

Beech Aircraft Corp.'s sales in fiscal 1957 will be 35% above the record \$74,539,000 of last year, John A. Elliott, secretary, said. Backlog now stands at \$112,500,000.

North American Aviation will earn \$34 million on \$1.2 billion sales in 1957, predicts chairman J. H. Kindelberger. Based on current orders and schedules, 1958 sales will drop to about \$700 million, he said. Current backlog is \$650 million.

Piper Aircraft Corp. reports earnings of \$2.6 million in the 11 months ended August 31. This is equivalent to \$2.96 per share. Net sales for the period were \$24.8 million.

Aviation Traders Accountant undergoes tests



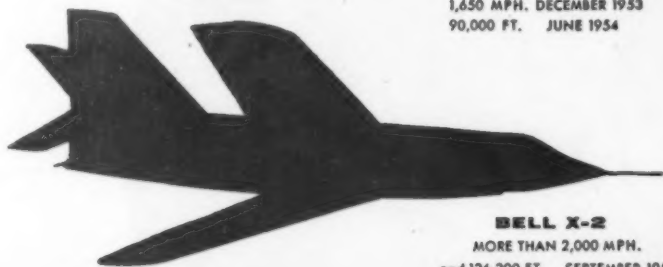
THE ACCOUNTANT, Aviation Traders' entry in the executive transport race, also is being aimed at the DC-3 replacement market. The Rolls-Royce Dart-powered turboprop is now undergoing flight trials in Britain.



BELL X-1
NEARLY 700 MPH. OCTOBER 14, 1947



BELL X-1A
1,650 MPH. DECEMBER 1953
90,000 FT. JUNE 1954



BELL X-2
MORE THAN 2,000 MPH.
and 126,200 FT. SEPTEMBER 1956

10 YEARS BEYOND THE SONIC BARRIER



...AND INTO THE SECOND DECADE
OF SUPERSONIC FLIGHT

Aviation history was made on October 14, 1947 when the Bell X-1 reached a speed of nearly 700 mph. Man had broken the sound barrier for the first time!

The rocket-powered X-1 thus opened the door to a decade of significant advances in high-speed, high-altitude flight. A few years later the Bell X-1A, successor to the X-1, set a new speed record of 1,650 mph and a new altitude record of 90,000 feet.

Then, still working in conjunction with the U. S. Air Force and the National Advisory Committee for Aeronautics, Bell produced the X-2 which reached more than 2,000 mph and 126,200 feet...the fastest and highest that man has ever flown.

Never intended for tactical operation, these experimental aircraft made invaluable contributions to aerodynamic design and the art of supersonic flight. They left their marks on the airplanes of today and tomorrow and blazed the trail to the supersonic age.

Today, ten years after the first flight beyond the sonic barrier, the team of Bell engineers responsible for the famous series of X-airplanes, is working on even more advanced aeronautical concepts. One of the more challenging of these is an aircraft which will combine the ability to take off and land vertically with the high speed and performance of a conventional jet.

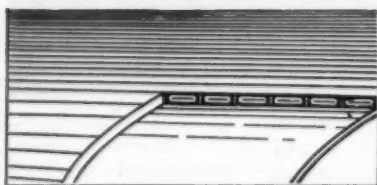


Aircraft Division
BUFFALO, N. Y.

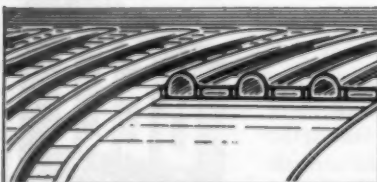
B.F. Goodrich



Pneumatic De-Icers keep radomes clear without distorting radar signal



Shown in relaxed position De-Icer's small rubberized fabric tubes are in line with the airstream to provide minimum air resistance during operation.



Tubes inflate and deflate in alternate pairs to snap off ice formations. Action is positive, dependable and simple.

GIANT BULGES distinguish the Navy's Lockheed WV-2, a vital link in our "early warning" defense system. Inside the bulges and in the nose are more than six tons of powerful, sensitive radar equipment.

Ice building up on the large exposed areas of these radomes can foul the radar signal. But lightweight B.F. Goodrich Pneumatic De-Icers, operating with compressed air, allow the radar to scan effectively at all times, with no excessive loss of radar energy. B.F. Goodrich De-Icers also protect radomes from abrasion, erosion and hail damage.

Pneumatic De-Icers are also on wing and tail leading edges giving the WV-2 complete B.F. Goodrich protection against ice hazards.

COMMERCIAL AIRLINERS, TOO

B.F. Goodrich Pneumatic Radome De-Icers, in constant use on military early warning planes, are now being adopted for commercial airliners, too. Whether you have aircraft in the design stages or in actual use, B.F. Goodrich Aviation Products engineers will be glad to show you how Pneumatic Radome De-Icers assure greater efficiency of radar equipment.

B.F. Goodrich Aviation Products

a division of The B. F. Goodrich Company, Akron, Ohio

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AMERICAN AVIATION

WORLD'S LARGEST AVIATION PUBLISHERS

New spending plan . . .

Pentagon revises figures upward to \$9.7 billion for aircraft and missiles in fiscal '58, an increase of \$918 million

by Henry T. Simmons

THE PENTAGON has substantially hiked its estimates of military expenditures for aircraft and missiles in fiscal 1958, although the widely-publicized ceiling of \$38 billion on total military spending for the fiscal year remains intact.

In a new outline of fiscal 1958 spending known as "EFAD 220," Pentagon budget experts estimated that the three military services will pay out a total of \$9,694,000,000 for aircraft and missiles this fiscal year, compared with an estimate of \$8,776,000,000 in January. This represents an increase of \$918,000,000 for aviation products.

The budgeteers fixed aircraft spending in fiscal 1958 at \$7,153,000,000, a jump of \$416,000,000 over the January estimate. They put total missile outlays at \$2,541,000,000, an increase of \$502,000,000 over their previous forecast.

The increase in spending forecasts for missiles and aircraft may appear startling in view of the recent wave of stretchouts and cutbacks in the aircraft industry, but the budget experts have a ready explanation. They point out that the actual rate of aircraft and missile spending at the end of fiscal 1957 was running generally higher than the new forecasts. Therefore, they say, a significant downturn must be effected in spending rates merely to stay within the expanded estimates.

If the new fiscal 1958 expenditure estimates are considered in the light of actual experience in fiscal 1957, something of the magnitude of the budgeteers' problem—and that of the aircraft industry—may be seen.

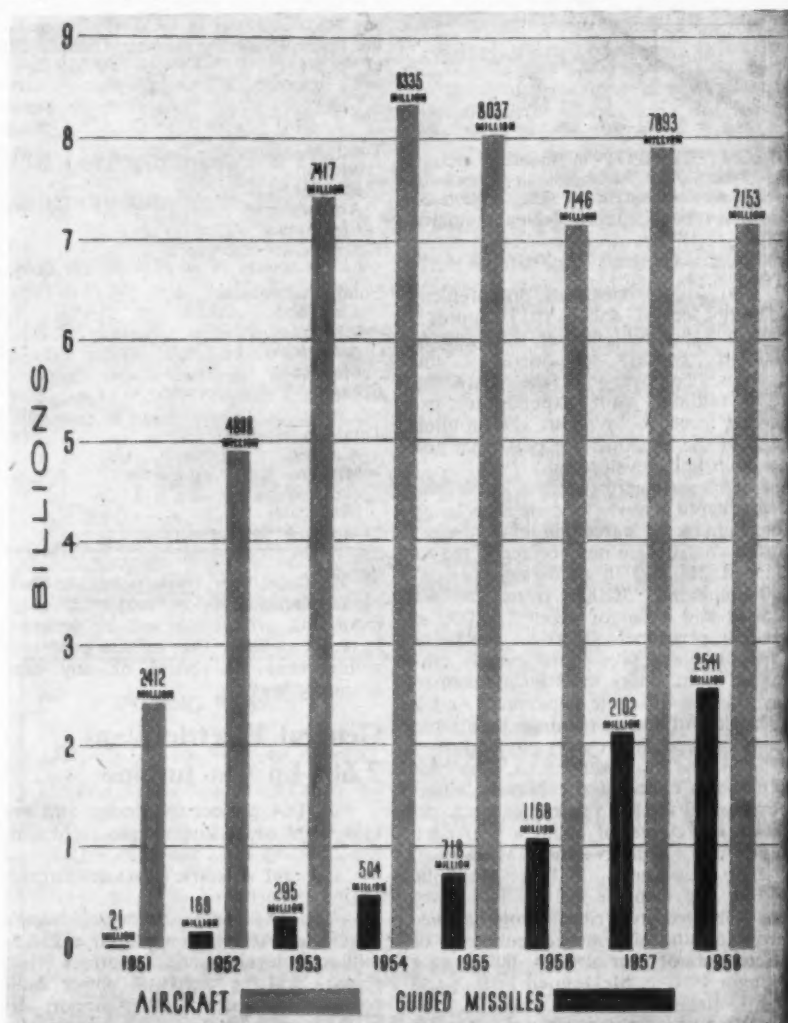
Total spending for aircraft and missiles aggregated \$9,995,000,000 in the fiscal year ended June 30, with the fastest spending clip occurring at the end of the period. The latest fiscal 1958 estimate for these two accounts provides for a net reduction of \$301,000,000, to \$9,694,000,000.

Significantly, the projected aircraft outlays have dropped sharply below the actual fiscal 1957 level, while the forecast for missiles has increased. Accord-

ing to EFAD 220, the three services will pay out \$740,000,000 less for aircraft in fiscal 1958 than the \$7,893,000,000 they actually spent in fiscal 1957. But

they will spend \$439,000,000 more for missiles this fiscal year than they did in fiscal 1957.

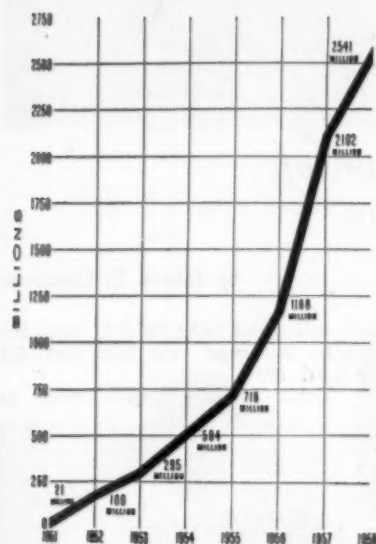
Total military expenditures in



DEFENSE EXPENDITURES for procurement of aircraft & missiles, fiscal 1951-1958.

—Source: Aircraft Industries Assn.

fiscal 1957, exclusive of foreign military aid, amounted to \$38,428,000,000—a husky \$2,428,000,000 above the Pentagon's estimate in January. Principally responsible for the runaway spending were the aircraft and missile accounts which together amounted to \$1.7 billion more last fiscal year than the amount estimated in January.



BRIGHTEST SPOT in industry picture for future lies in missile procurement which has soared from \$21 million in 1951 to more than \$2.5 billion estimated for fiscal 1958.

—Source: Aircraft Industries Assn.

All other hardware procurement accounts ended fiscal 1957 approximately \$150 million over the January estimate. Outlays for operation and maintenance over-shot the mark by \$250 million, while expenditures exceeded forecasts by about \$140 million each in the accounts for personnel and research and development.

Defense Secretary Charles Wilson has ordered a variety of steps to bring the Pentagon's careening expenditures under control. He has decreed a reduction of 200,000 in uniformed personnel (including 50,000 from the Air Force) and a cut of about 150,000 in civilian personnel. Overtime payments to contractors have been severely curtailed. Contractors have been asked to lay off 5% of their personnel. And a reduction of five percentage points has been ordered in progress payments.

In the hardware area, the Air Force has canceled the Navaho intercontinental missile project and has ordered stretchouts of about a year each for four fighters—the McDonnell F-101, Lockheed F-104, Republic F-105 and Convair F-106. The Navy has canceled its Triton ramjet missile program and announced cutbacks or stretchouts of four aircraft—the Chance Vought F8U-1, McDonnell F3H-2 and the Douglas F4D-1 and A4D-2.

If these actions are not sufficient to insure a spending level of no more than \$19 billion during the first half

Breakdown of Defense Dept. spending, fiscal 1957 & 1958

The following table shows actual fiscal 1957 military expenditures in selected accounts together with a comparison of the latest estimate of fiscal 1958 spending (EFAD 220) and original January estimates (EISED 220), as well as the changes between the two forecasts (in millions of dollars):

DEPARTMENT OF DEFENSE

	Fiscal 1957	Fiscal 1958 (EFAD 220)	Fiscal 1958 (EISED 220)	Change
Personnel	\$10,370	\$10,345	\$10,409	—64
Operation & Maintenance	9,392	9,465	9,598	—133
Procurement	(13,576)	(13,080)	(12,273)	(+807)
Aircraft	7,893	7,153	6,737	+416
Missiles	2,102	2,541	2,039	+502
Ammunition	NA	366	512	—146
Electronics	NA	770	927	—157
Production equipment & facilities	NA	569	345	+224
Public Works	1,895	1,845	2,242	—397
Research & Development	1,686*	1,680	1,580	+100

*Includes \$75,000,000 to be spent by the Office of the Secretary of Defense.

Although the increases in this presentation would appear to outweigh the reductions by a substantial amount, the Pentagon has taken other actions such as the elimination of certain proposed OSD expenditures and a more drastic "draw-down" from balances accumulated in working capital funds so that the projected total expenditure for fiscal 1958 remains at \$38 billion.

Breakdown of services' spending, fiscal 1957 & 1958

Here is how much the individual military services actually spent in key hardware and R&D accounts in fiscal 1957, together with the latest estimate (EFAD 220) and the original January estimate (EISED 220) of their fiscal 1958 spending (in millions of dollars):

	ARMY		
	Fiscal 1957 (Actual)	Fiscal 1958-new (EFAD 220)	Fiscal 1958-old (EISED 220)
Total procurement	(\$1,562)	(\$1,272)	(\$1,358)
Aircraft	168	166	109
Missiles	420	545	562
Ammunition	NA	87	206
Electronics	NA	113	174
Research & development	434	420	410
	NAVY		
Total procurement	(3,656)	(3,780)	(3,652)
Aircraft	1,913	1,755	1,645
Missiles	265	252	264
Ammunition	NA	258	256
Electronics	NA	162	153
Research & development	523	515	500
	AIR FORCE		
Total procurement	(8,327)	(8,012)	(7,248)
Aircraft	5,812	5,232	4,983
Missiles	1,417	1,744	1,213
Ammunition	NA	21	50
Electronics	NA	495	600
Research & development	729	670	670

of this fiscal year, Wilson has warned, further reductions in major procurement and production will be ordered. It is not unlikely that missile programs would bear the brunt of any new economy wave.

General Electric plans 2,600-hp gas turbine

A T64 project for design and development of an aircraft gas turbine in the 2,600-hp class has been established by General Electric's small aircraft engine department.

The T64 engine, for which Navy's Bureau of Aeronautics placed a \$58.5-million development contract last spring, will be used to power helicopters, transports or other support aircraft. It will have a basic power section to which individual units can be added for making it either a turbo-

prop or a turboshaft powerplant.

Harold T. Hokanson, formerly head of the J85 project, is manager of the new project.

McDonnell loses out on Triton cancellation

Involved in the Navy's cancellation of its Triton air-breathing missile program was a \$6.5 million contract with McDonnell Aircraft Corp. Navy expects to recoup about \$1 million of this contractual obligation. Total investment in the program was \$24 million.

McDonnell, which had about 300 employees assigned to the project, plans no layoffs. Navy will continue some support of the guidance (Goodyear Aircraft Corp.) and other features of the Triton for application in other weapon systems.

Litton Industries laboratory simulates pressure conditions at altitudes up to 100 miles

An inhabited high-vacuum environmental laboratory able to simulate pressure conditions prevailing up to 100 miles' altitude was revealed last week by Litton Industries, west coast electronics firm that conceived and designed the facility.

The development of this new Air Force-industry research tool was monitored through the Air Research and Development Command by the Air Force Office of Scientific Research's Directorate of Advanced Studies, Pasadena, Calif.

Pointing out that the laboratory will be an invaluable tool for performing fundamental studies needed for developing ultra-high-altitude weapon systems, Brig. Gen. Hollingsworth F. Gregory, Commander of AFOSR, revealed that the facility comprises a chamber eight feet in diameter and 15 feet long, and a unique pressure suit which permits researchers to observe and control experiments inside the vacuum chamber.

Dr. Morton Alperin, head of the Directorate of Advanced Studies, said

that the Litton chamber will permit scientists to explore many fields more thoroughly, including (1) the workings of lubricants in ionospheric environments where common lubricants are known to vaporize; (2) the operation of gears, sliding contacts and other such devices, when established concepts of friction are altered by the lack of an air-layer between the contact surfaces; and (3) the absorption and reflection of radiant heat in the absence of surrounding air.

He added that with the new laboratory, it becomes practical to test the extra-terrestrial reactions of components, materials and human protective-equipment when exposed to radiations such as unfiltered sunlight, X-rays and ultra-violet rays. These would be beamed in through portholes in the vacuum chamber.

H. W. Jamieson, Litton vice-president-engineering, pointed out that his company's vacuum chamber will permit completion within a few days of some electron-tube experiments that formerly required several months.

Pentagon to keep sharp check on performance, quality, Gen. Irvine tells electronics manufacturers

Pentagon budgetary measures made necessary by strict Defense spending limitations will take the shape of new procedures and programs to forecast and control spending more closely, according to Lt. Gen. C. S. Irvine, USAF Deputy Chief of Staff-Materiel.

Addressing the Electronic Industries Assn. in Los Angeles recently, Irvine said these new methods will be formulated to forecast and control spending right down to the plant, so Defense officials can periodically determine fiscal trends month by month and quarter by quarter.

This simply means, he added, if expenditures exceed estimates, quantities will be cut. If cost per item runs too high, projects will be canceled.

Irvine indicated these three factors emerge as predominant in all recent discussions of cutbacks:

Substantial increases in performance must be provided by weapon systems produced in the future. He explained the Air Force will not replace an aircraft for a mere 100-mph speed increase or 5,000-ft. jump in altitude. USAF does not intend to program for new interceptors in the Mach 2 regime, but rather Mach 3 or better, he noted.

Positive quality control will be mandatory throughout the design-to-production cycle, with extremely exacting specifications—determined by engineers and designers—precisely adhered to by all fabrication and assembly plants. "The machine must be combat ready when we accept and pay for

it," Irvine said, "... if it isn't, we will keep the checkbook in repose until our standards are met."

Fewer end items of a particular vehicle probably will be programmed by the USAF in the future. Irvine attributed this change in procurement thinking to vastly increased destructive potential of newer weapon systems, but

even more important, he said, it will also allow transition to more advanced systems without making obsolete an unacceptable number of first line aircraft.

Wolfe report urges sale of obsolete planes

U.S. military services need modern jet transports and their purchase could be financed by sale of the military's obsolete "World War II vintage" transports, according to Thomas Wolfe, head of Thomas Wolfe & Associates, and formerly director of requirements, procurement and distribution for the Defense Dept.

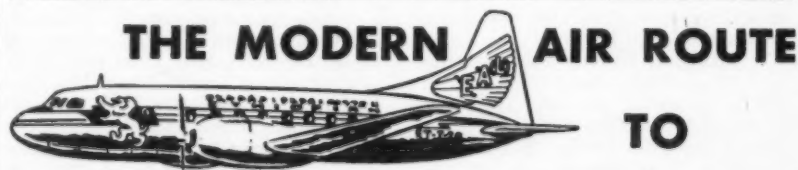
All present equipment should be sold to airlines throughout the world and funds used to buy modern military jets, he said, adding: "A portion of this new jet equipment could then be leased to air carriers as a reserve fleet to contract with the military in assuming a portion of the mounting traffic now carried by military air transport."

Navy BuAer restricts contractors' hiring

Tight restrictions on new hiring by its contractors have been ordered by the Navy Bureau of Aeronautics.

In a telegram to contractors, BuAer said: "Effective immediately, all BuAer contractors requested to do no hiring in support of BuAer contracts other than that absolutely essential to replace attrition losses. This action is necessary to control expenditures."

"Request prior clearance from BuAer in each case where additional hiring deemed necessary to meet schedules. Above instructions apply to indirect and direct employees under all contracts."



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Roy Hurley disputes Hebert on Curtiss-Wright charges

by Charles Schaeffer

SHARP, opposing statements, issued in the between-sessions lull of the 85th Congress put the Curtiss Wright Corp. in direct conflict with House sleuth F. Edward Hebert (D-La.).

As the first phase of a probe of the aircraft engine industry ended abruptly, C-W president Roy T. Hurley flatly challenged these Hebert charges:

A shift of an overhaul contract for 500 J47 engines from General Electric to C-W facilities at Utica-Bend in 1956 cost the taxpayers \$25 million or more.

High Administration officials, presumably at Cabinet level, ordered the Air Force action as a payoff for the C-W "bailout" of the financially-ailing Studebaker-Packard Corp.

The Curtiss-Wright chief, in a lengthy report to the Armed Services Investigations Subcommittee, denied the allegations and he handed lawmakers recommendations of his own for solving aircraft procurement and manufacturing problems.

A key point of the Hurley denial was that the \$25 million figure was for 12 years of advance rent paid to S-P as part of the aviation firm's agreement to give the automobile company a "leg-up." The sum, he said, bore no relation to the overhaul contract.

Hurley put the cost of readying the Utica-Bend plant for the overhaul work at \$474,000. "Curtiss-Wright provided the plant space required . . . with its own funds in accordance with its lease agreement with the Studebaker-Packard Corp.," he said.

Chairman Hebert, who had promised to document contentions, did not elaborate beyond his first claims, except to say the "files of the Air Force" proved his case. Using the Hurley rebuttal as a springboard, Hebert commented sarcastically:

"I was in error in one detail, however. I stated that the transaction had cost the taxpayers \$25 million. Although this is denied by Mr. Hurley, his statement indicates that instead of costing \$25 million to the taxpayers, the deal really cost many millions more.

"The \$25 million figure is covered in one admitted item, the \$25 million advance rental to Studebaker-Packard by Curtiss-Wright for the two defense plants at Utica-Bend and Chippewa. . . . While the money was paid by Curtiss-Wright to Studebaker, it is reflected in the cost of operation of the defense plants, which of course is paid for out of American taxpayers' money."

Curtiss-Wright took quite another

view of the proceedings. Asserting that the firm was prompted to aid S-P after a plea for help, Hurley said 30,000 jobs were at stake, plus the interest of thousands of stockholders and automobile owners.

Following the appeal, C-W moved to establish a sort of advisory management over the auto firm and proposed to:

Form a wholly-owned subsidiary backed by sufficient capital to carry out the defense part of the program, to be called the Utica-Bend Corp.

Provide for the subsidiary to lease S-P's Utica-Bend and Chippewa defense plants for 12 years at a total advance rent of \$25 million.

Authorize the unit to take over S-P's defense contracts, except those about to expire.

Provide for C-W purchase from S-P of the capital stock of Aerophysics Development Corp. and payment to S-P of \$1,800,000, the money the auto firm had put into the company.

Enter into a three-year advisory management contract with S-P.

According to the Hurley statement some \$95 million in defense contracts relating to the S-P negotiations had been granted Utica-Bend since Aug.

6, 1956. They included orders for Army Dart missiles, J57 engine components, diesel engine kits, trucks and overhaul and engineering services.

At one point an anticipated loss of J57 engine business was cited by Hurley, who said: "We expect the Defense Department to provide other business to replace (it) . . ."

The C-W head simultaneously recommended: that officials revamp procurement rules that will recognize, "via the profit route," efficiency, low cost and high quality; that government purchasers drop the practice of treating taxes as profit in negotiating contracts; wider use of the firm fixed price and incentive type contract, and a sharp cutback of duplicate reviews and counter-checks of contracting procedures as well as increased flexibility for contracting officers.

Of the entire Curtiss-Wright negotiations, Chairman Hebert had this much more to say:

"I readily admit that saving Studebaker-Packard was good for the economic position of the nation at the moment; but I cannot agree that a private industry should have been 'bailed out' contingent on exacting defense contracts as the price."

Rep. Harris attacks Celler report

The post-adjourment disclosure of an attack on the Celler antitrust airline report by Rep. Oren Harris (D-Ark.) came as a mild surprise to some Congressional observers. The Chairman of the House Commerce Committee, in a sharp rebuke of the tactics of antitrust investigators, said he was "shocked and surprised" by the report calling for a Justice Department probe of certain airline activities.

The Celler unit (AMERICAN AVIATION, Sept. 9) recommended an antitrust study of the Air Transport Association and, among other things, urged CAB to initiate a general investigation of Pan American Airways.

What Harris seemed most disturbed over was an alleged tendency of investigators to "disregard" the record and to "exceed" their authority. The Arkansas lawmaker said he was opposed to the report's recommendations, mostly because probers: (1) failed to support adequately their derogatory charges in the antitrust area and (2) dealt in irrelevancies, overstepping the bounds of a subject of appropriate concern to a judiciary unit.

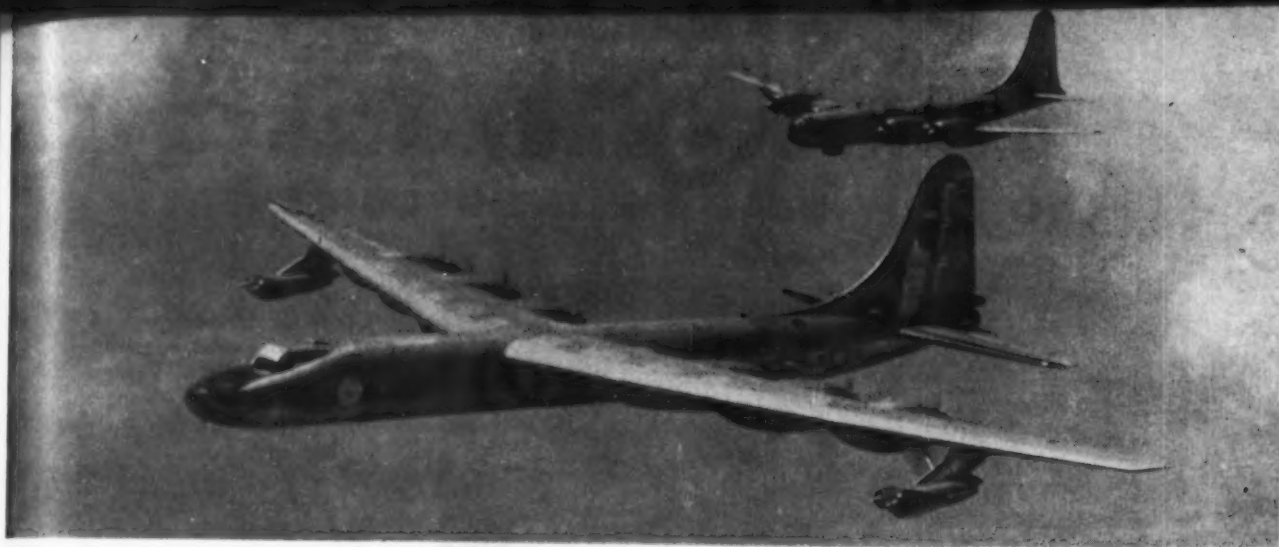
"Similarly, the report is deficient in failing to mention or properly evaluate countervailing evidence weighing upon a variety of disputed issues," Harris said.

Parts of the majority report dealing with the Air Transport Association, the International Air Transport Association and the extent of CAB authority over certain matters "are characterized by a one-sidedness not representing a fair evaluation of the whole record," he said.

In his rebuttal, Harris disagreed with the subcommittee's comments on Pan American Airways.

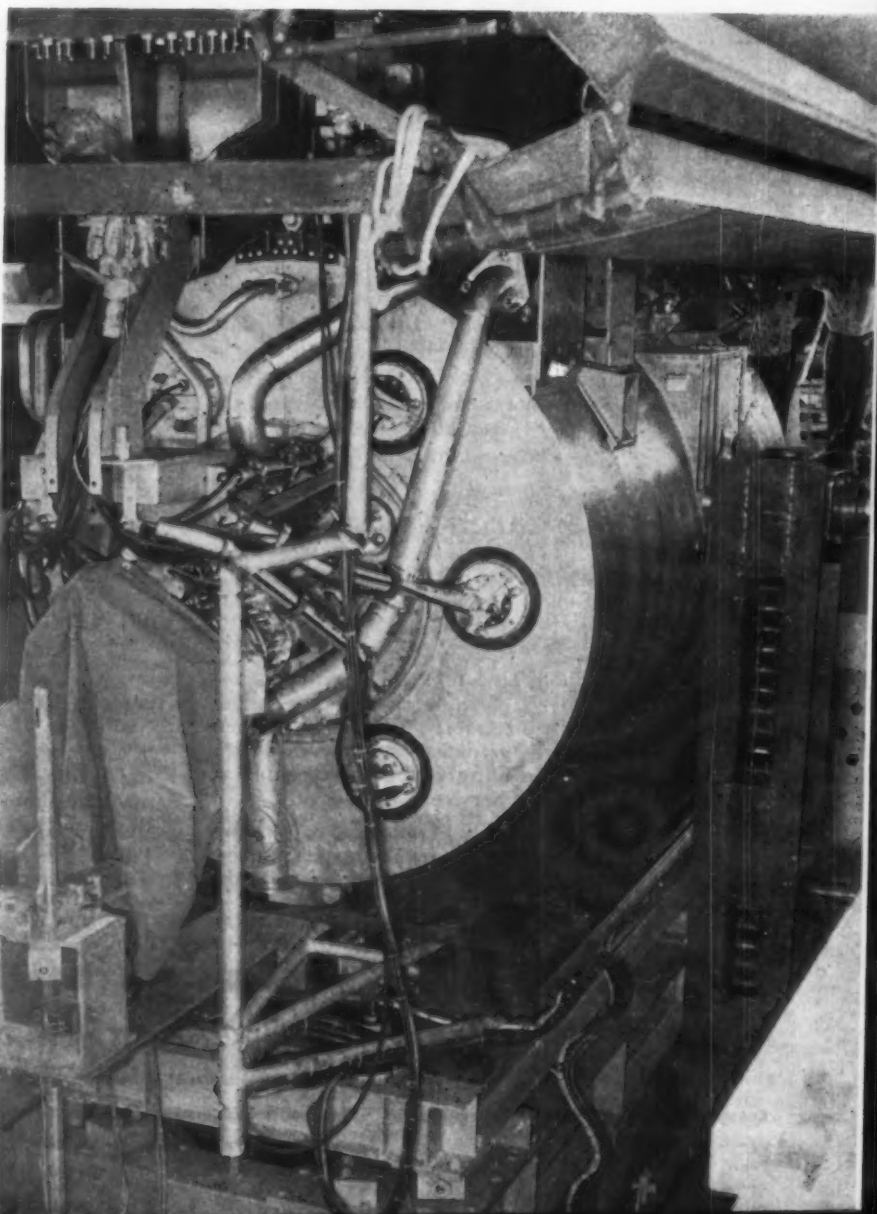
"I do not believe the report accurately analyzes the intensely competitive atmosphere in which international air services are now operated or the competitive positions of carriers operating in those fields," Harris asserted.

Whether or not the sharp dissent of the influential Commerce Committee chairman would have any bearing on the Justice Department's decision was not immediately clear. Department spokesman acknowledged that the antitrust report was under study.



First details of Convair reactor-carrying NB-36H

ABOVE. Shown in flight is the nuclear test airplane—the NB-36H—carrying the world's first airborne reactor. Aircraft is a B-36 that has been modified to provide radiation shielding for crew members. Chase plane in background is a B-50 that accompanies the Convair NB-36H on each flight for observation purposes.



AT RIGHT. The airborne shield test reactor is lifted by elevator into the specially-fitted bomb-bay of the NB-36H. Picture evidently was taken during initial fitting tests before the reactor went "hot"; note men in background. Loading operations now must be conducted with assistance of closed-circuit television to prevent radiation reaching personnel.

BELOW. Note heavy shielding of "man-hole cover" atop cabin, indicating great problem of protecting crew from radiation.



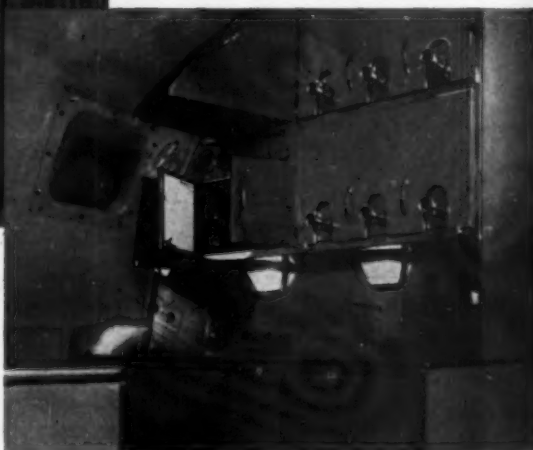
LOUNGES and GALLEYS

TO INDIVIDUAL AIRLINE REQUIREMENTS



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Better bearings needed—but who'll pay for research?

Aircraft industry, military want new anti-friction devices for hi-temp engines, supersonic planes and missiles

by William Beller

ARE BEARING MANUFACTURERS stalling on the job of giving the aircraft industry the products it needs? Many informed observers say they are. These critics point to the jet powerplant field where, they allege, lack of temperature-resistant bearings are thwarting future developments.

The critics also call attention to the airframe field where, they say, insufficient bearing research is holding back development of advanced supersonic aircraft and missiles that need high-temperature, high-load bearings for control mechanisms of aerodynamic surfaces.

Because some aircraft manufacturers are giving financial help to bearing companies for development work, many of the companies have lost their early initiative, say some bearing users. They accuse the companies of neglecting long-range research and development work.

Although it is recognized that the bearing industry is constantly testing new materials and lubricants as they come to market, the critics ask why manufacturers have not set up their own privately-financed research laboratories, or at least cooperative ones. After all, the bearing industry should not be depending on the shotgun research of its suppliers to hit targets requiring the accuracy of rifles.

The bearing makers pose this question: Who is to pay for all the facilities and studies that are being asked for? They point out that on a percentage of sales basis, the research activity for aircraft bearings far outstrips that being done for any other industry. Despite this, they say, bearing companies would invest even more manpower and facilities for additional aircraft bearing research were it not economically hazardous to effect programs where bearing production demand would be small.

In general, the jet powerplant industry wants bearings that will live in high-temperature environments, sustain high speeds under high loads and still be capable of being housed in small volumes.

A prime need of the industry is for a predictable minimum life guarantee for any bearing. So far, this is a specification that bearing manufacturers are unable to give. The best that is done is based on statistical life expectancies. These give small com-

fort to an engine builder who fears that his may be the product impaled on the left-hand end of a normal curve.

The most troublesome bearing problems occur in the powerplant and its accessories field. For example, in afterburner control mechanisms, between 20 and 200 bearings are used, depending on the design. These bearings must operate in short cycle spurts under high temperatures, high loads and very low speeds—about three revolutions per second per bearing.

For so many bearings running at such slow speeds, a lubrication sys-

tem is out of the question, even if a satisfactory lubricant could be found.

Still, the engine makers must have highly reliable and accurate bearings able to operate in the 500°F range.

The trouble with many such bearings is that the metals used form thin oxide films for protection against high temperatures. These oxides are brittle and, under stress, flake off and choke the bearings.

The engine-makers eventually will want dry-running 1,200°F turbine bearings. With such bearings, 50 to 100 pounds of lubrication system could be eliminated and a higher thrust-weight ratio achieved.

Knowing that these and many other critical needs exist, what is the bearing industry doing about satisfying them?

"Plenty," said a Fafnir Bearing Co. spokesman. Here is one of the examples he gave:



FAFNIR TECHNICIAN operates testing machine to determine lost motion in aircraft control rods. Test is done by comparing input and output deflections.

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known as a supplier of engine bearings. Nevertheless, on the basis of Fafnir's having outfitted up to 90% of a competitor's engine with main rotor bearings, Fafnir was given the challenge.

How results were achieved

The results of this challenge, which were gained only by intensive research and development work both by Fafnir and the engine builder, were these:

Although Fafnir had started work two years after other prospective suppliers, the company was the first to qualify with the key main rotor bearings.

After three years of subsequent development work, Fafnir became the major source qualified on similar bear-

more stringent, bearing performance becomes increasingly critical. This is one of the chief reasons why bearing manufacturers are the first to be squeezed whenever a powerplant innovation occurs.

Anticipating the advanced-performance engines, several bearing manufacturers looked to high-temperature tool steel as a bearing material. The fabrication problems are appreciable. For example, Fafnir says it can grind three to five regular bearing races in the time it takes to grind just one tool-steel bearing raceway. And the material costs are also higher. Here are some comparisons:

Regular 52100 steel costs about 15 cents per pound; vacuum-processed, \$1.75-\$3.50, depending upon individual specifications.



NEW DEPARTURE has completed a full-scale high-temperature test rig that can simulate extreme environments including those experienced by jet engine bearings.

ings for the second of these two Air Force jet engines.

"We depend on outside vendors of materials and lubricants to help solve our problems," said the Fafnir spokesman. "No bearing company could exist without such aid." He added that every manufacturing company, whatever its products, must to some extent count on work by its basic materials suppliers. The degree of dependence rests on the nature of the problem to be solved and on business factors.

He pointed out further that current bearings now use air-melt 52100 bearing steel, a material that might be called "standard." Yet today's engines are probably the last military engines that will be using standard 52100. Bearing companies are working to increase jet engines' margins of safety by using vacuum-processed 52100.

As jet engine speeds, loads and dependability requirements become

High-temperature tool steel costs \$1 per pound; vacuum-processed, \$4.

Unhappily from a cost standpoint, best results are coming from the vacuum-processed tool steel.

R&D for instrument bearings

Instrument bearing users are not today overly concerned with the temperature problems that are confronting other segments of the aircraft industry. However, these users, too, are constantly searching for lighter weight, smaller volume, more rigid yet more torque-free bearings than the ones on the market now.

Even when such bearings are developed, there arises a major quality control problem for both the manufacturer and the bearing company. As an instance, until recently, when instrument manufacturers assembled gyros, the companies stood a good chance of having only about 30% of their gyros operating satisfactorily. In most cases,

the malfunctioning was blamed on the bearings—perhaps rightly so.

The Barden Corp. of Danbury, Conn. recognized this quality control problem nearly ten years ago. Company engineers spent subsequent years defining the problem and determining how its solution could apply to an instrument manufacturer. Growing out of this work was an electronic tool called the SmoothRator, which reveals the performance qualities of bearings through their vibrational characteristics.

The SmoothRator tests oil-lubricated precision bearings in the instrument size only. The value of this device lies in its ability to ferret out bearings apt to result in malfunctioning devices. This is done on a production-line sequence before the expense of assembly is incurred.

The unique needs of gyro designers and producers stem from the nature of the gyroscope. The gyro, which is the heart of most aircraft and missile guidance systems, stays fixed in space through the angular momentum created by a rotor spinning on its axis, supported and positioned by bearings. When the vehicle guided by the gyro is subjected to accelerations, a phenomenon called precession tends to twist the rotor from the original reference position.

Rigidity and isoelectricity

Under certain conditions, errors caused by precession can be substantial. By minimizing precessional errors, the gyro builder can provide far greater guidance accuracy. One means of holding down precessional errors is through the use of bearings having special and unusual characteristics. Chief among these characteristics are rigidity and isoelectricity.

Rigidity is needed to minimize thrust-wise shifts of the rotor from its delicately balanced position, since center of gravity shift will introduce precession. Isoelectricity, which is the state of equal yield or elasticity along radial and thrust axes, is needed to be sure that under accelerations any shift in e.g. will be in a direction that does not introduce precessional errors.

The need for isoelectricity has grown as more accurate gyros have been developed from the relatively crude instruments used during World War II. System isoelectricity is the target, and bearings comprise only one of the elastic components which add up to radial and thrust yield. However, the bearings are the crucial components, for they can be varied in design to compensate for differing radial and thrust yields of the other parts.

The Barden Corp. began its research on isoelectricity in 1947. At that time, it undertook for Massachusetts Institute of Technology a pioneering program directed toward highly accurate, extremely rigid bearings for the rotor-spin axis. Results of this program were evident at its conclusion two years later, when the way was opened for

Royal Swedish Navy Orders Vertol 44's

A special committee of the Swedish Navy made a year-long study of helicopters suitable for anti-submarine warfare as well as utility transportation. In the United States they consulted with headquarters personnel of the three armed services, visited helicopter manufacturers and toured military operating units.

At the conclusion of this intensive study, the Swedish Navy placed an initial order for four of the 22-place Vertol 44's, to be augmented later by additional procurement.



Official Navy announcement of the purchase said the choice was mainly based upon the Vertol 44's "good stability in hovering and towing missions, good instrument flight capabilities and mission endurance . . . practically unlimited controllability for the contemplated missions."

Sweden thus became the fifth western nation to purchase the sturdy Work Horse helicopter, first choice of the experts for the most difficult assignments.

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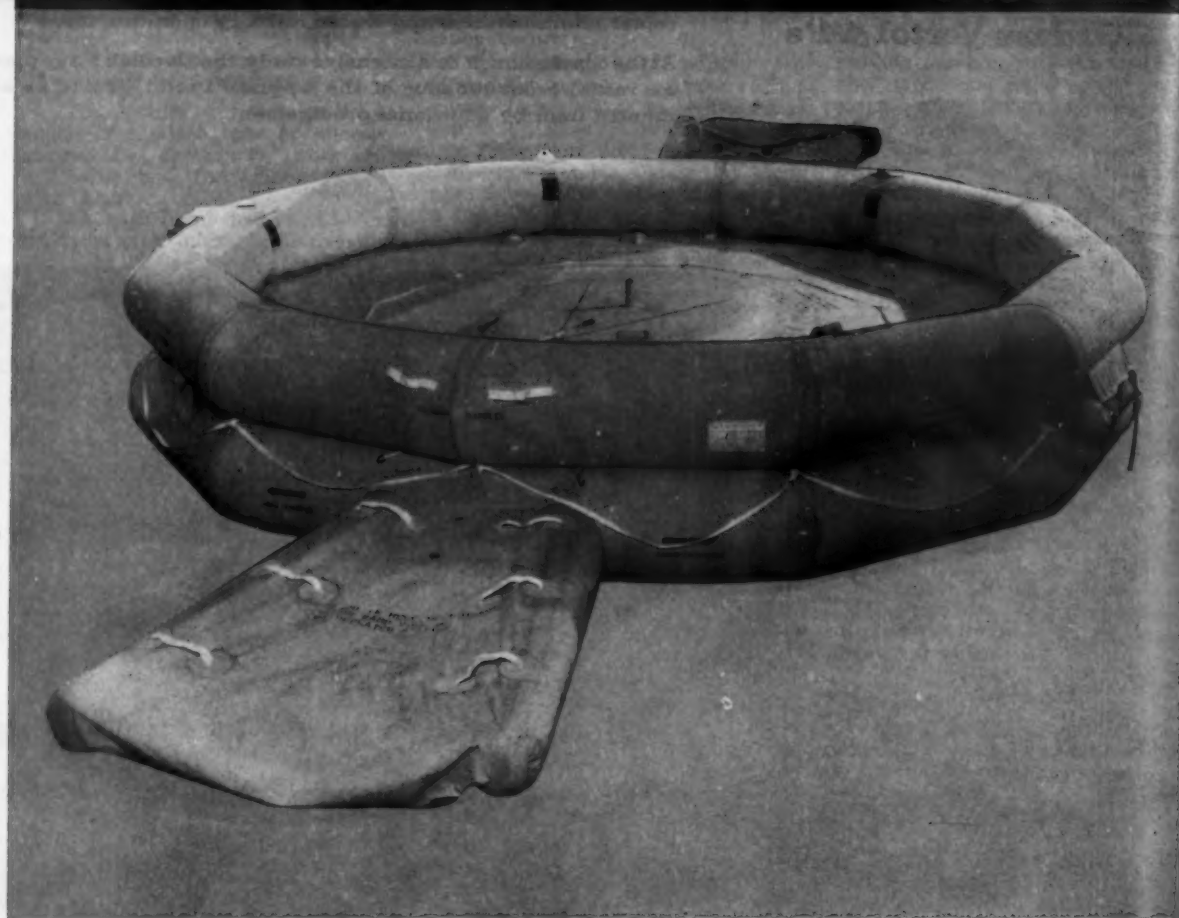
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design and production of a number of new super-precise gyros.

Since 1949, Barden has carried on its own research program to advance the theory and technology of isoelectricity. Having achieved isoelectricity bearings, Barden engineers—once they were appraised of the yield rates of all other components in a particular gyro—could back off to the specific combination of radial and thrust yield rates needed to balance out the totals and achieve isoelectricity of the whole unit.

Economic factors stymie companies

That the bearing industry is solving its more or less immediate problems is admitted. Still some observers persist, the long-range bearing problems, such as those involving very high-temperature operation or nuclear radiations, are solved only as by-products of work in other industries.

This point was conceded by several of the major bearing companies. But, they asked: How far out on the economic limb are we expected to climb? One company gave this example:

On the suggestion of a government agency, the company spent several months and thousands of its own dollars to research and develop a material and a bearing that could perform in a unique but devastating environment. The work was successful. The bearing was sent out for bid and a competitor got the contract because of a slim price difference—a difference that the first company had to include to amortize its research work.

This incident is by no means an isolated one. Even though bearing companies are delighted when the military or industry ask for research help, the cost of this work must be paid by somebody. In most cases, the prime contractor picks up the bill as part of the overall development cost of his product.

Where the work is of fundamental nature, the cost is often shared. Yet, there are some projects proposed, many involving high costs to the bearing manufacturers, for which funds are not currently available.

The bearing companies are willing to finance some work in order to better their competitive standing. Other projects, which may be of equal technical importance, call for an extension of money and facilities that the companies cannot afford. It is this undone work that is giving rise to criticisms of the industry.

One quick way to make an enemy out of a bearing engineer is to ask him what development work there could possibly be in his product. He merely has to build a container for a set of rolling elements.

The truth is that the design and performance requirements for aircraft bearings are more stringent than those met in any other industry. Tolerances are set within a few millionths of an inch, mean compressive stresses can rise above 500,000 psi, and hardnesses are often staked above Rockwell Rc 60.

When high temperature problems are involved, the progressive companies must obtain contracts for more engineering studies and test equipment. New Departure Division, General Motors Corp., obtained this help a few years ago when the company designed and built a full-scale, high-temperature bearing test rig. It went into service only a few weeks ago.

This test rig, which took eight months to design and two years to build, was a two-decade dream of General Motors bearing engineers and management. They sparkplugged the effort, which has resulted in what is probably industry's most advanced high-temperature bearing test facility.

This facility is instrumented to test bearings from 70-mm bore diameter to 140-mm, to measure inner and outer race temperatures from room to 1,000°F, and to measure bearing loads up to 25,000 pounds radial and 75,000 pounds thrust. Any of the several types of lubrication systems, including an inch of gas blanketing, can be simulated. Cyclic and vibration loads can also be introduced.

New Departure is in an enviable position for research and development work because of the company's affiliation with General Motors Research Center. This agency makes basic technical studies for the benefit of all company members of General Motors.

This does not mean that New Departure can depend upon the Center for solving problems peculiar to the bearing industry. For this work, the company must set up its own program and must compete on its own merits.

New Departure's master program for developing jet engine bearings is divided into four phases.

Phase I: 300°F bearing operating temperature with soak-back to 500°F. (Soak-back temperatures occur immediately after engine shut-down.) This work is done.

Phase II: 500°F bearing operating temperature with soak-back to 750°F. This work is in the research stage.

Phase III: 750°F bearing operating temperature with soak-backs up to 1,000°F. A few manhours are being spent projecting schedules for this work.

Phase IV: Develop bearings able to operate between 1,100°F and 1,500°F for accessory powerplant equipment.

Lubricants retard progress

A late phase project not yet enumerated calls for bearings able to operate in the over 2,000°F range. These conceivably could be used for atomic energy applications.

Only a few years ago the metallurgists held the reins on the development of high-temperature bearings. A bearing running at 400°F was high-temperature operation at that time. Shortly, the metallurgists forged ahead by going into the area of high-speed tool steels, which challenged the chemists to better their lubricants.

As late as 1954, the chemists were able to prove to their own satisfaction that 450°F was the thermal barrier for lubricants. Above this temperature, it was said that lubricants would loosen their molecular bonds and fall apart. Currently, lubricants are performing for short periods under moderate loads and speeds at 600°F, and chemists are intimating that 1,000°F greases already exist.

The metallurgists accepted the new challenge by persuading the steel industry to give them vacuum-melted alloy steels. Some of the more rigorous specifications that the metallurgists laid down for new and ultra-clean alloys still cannot be met by the steel industry, except in research quantities of the materials. These have performed beyond expectations.

It is once again the chemists' turn to advance their art, this time to find lubricants to service vacuum-melted steels. Many bearing engineers are pessimistic about the chemical industry's willingness to spend much time making this search.

Pyroceram called possible answer

A few months ago a brand new material appeared on the market. Called Pyroceram, it was developed by Corning Glass Works. Essentially a crystalline material formed from a non-crystalline glass, it is non-porous and harder than most ceramics and many metals.

Best of all from a bearing standpoint, the Pyroceram family comprises one of the few fairly high-strength materials known today that can withstand temperatures in the 1,500°F to 2,500°F range without oxidizing or losing their hardness, and that can be mass-produced.

In its glassy (non-crystalline) state, prior to heat treatment, Pyroceram may be centrifugally or investment cast, or may be drawn in tubes or rods, or rolled into sheets. Bearing components may be made by casting the races by lost-wax investment casting, heat treating for conversion of material to a ceramic, and lapping to final geometry. Unlike glass, Pyroceram is easily worked in its glassy state.

New Departure is trying Pyroceram in bearings destined for 1,000°F operation. For this project, the company is now building experimental bearings for testing at 1,000°F and above in a full-scale accessory-bearing rig. New Departure expects initial testing of the bearings to be finished early next year.

Despite the ingenious solutions to bearing problems that Fafnir, New Departure and nearly every other company in the bearing industry are finding, the basic questions still remain unanswered: Who is going to do the fundamental research to develop materials and lubricants specifically for bearings? Who is going to pay for the many theoretical studies that are needed for advancing the art but that

are going begging for lack of sponsors?

The director of research of a major bearing company told **AMERICAN AVIATION** that his industry is being hamstrung because bearings are being treated as just another piece of hardware. Like rivets and bolts, bearings have always been on the shelf when an aircraft engineer wanted them. Lately, though, these engineers are finding some of the shelves bare.

One possible solution that appears to have merit was suggested: establishment of an Anti-Friction Bearing Research Center, which would be

supported either in part or entirely by the military.

Basic services outlined

The Center would perform two major services: (1) basic research, which would be done by metallurgical and chemical research laboratories with the advice and help of the bearing industry; and (2) correlate the vast amount of bearing data in order to stop duplicated efforts, to pinpoint problem areas, coordinate programs and recommend research tasks.

Of the several bearing companies

asked about their willingness to join such a Center, all said they would be glad to cooperate provided the organization were properly constituted.

The Torrington Co. felt that no one bearing company has the facilities for the intensive research that aircraft bearings need. The spokesman added that his company would favor some type of joint program that would result in a concerted effort to do the required work.

Fafnir would welcome any means of cutting down duplicated engineering research effort. In time spent at various sponsored technical conferences, where much of the same groundwork is gone over time and time again, the possible manhour savings would be tremendous, said a company executive.

New Departure is keenly interested in "any proposal that will help find means for us to carry on research and development work on bearings for high-speed, high-temperature and low torque applications at a pace that will satisfy military and industrial demands."

Agreement on need

The Barden Corp. heartily agreed that there is a need for a bearing research center. However, the mechanics of founding it full-blown were said to be highly complex. It was advised that initially such an agency should be conceived with one prime objective: to establish means for interchanging technical data between the government, research organizations and the bearing companies.

Success here, according to Barden officials, would be invaluable and would pave the way for an expanded program.

Most of the bearing companies—there are several exceptions—have two major complaints against the military and industry. The companies say that they are often prevented from doing their best work because security restrictions hide the applications of their products.

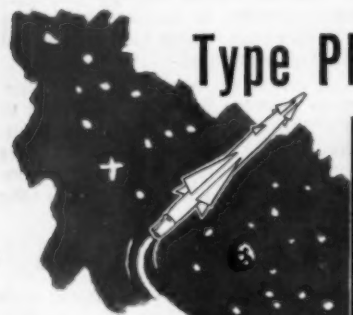
In one instance, a bearing engineer was given a piece of a blueprint and told to design a bearing to fit the installation.

The second complaint is that, unlike the situation in the automobile industry, bearing engineers are called in most often only after a design has been set and bearing trouble is imminent. If these engineers were consulted earlier, they say, much time, trouble and money could be saved.

In answer to their critics, the anti-friction bearing manufacturers say they want to make their products capable of meeting any prescribed environment. To do this, the manufacturers are spending many manhours to find solutions to the more pressing problems.

In most cases, it is not economically feasible for the bearing companies to do more.

Still, basic research on bearings is essential if they are not to drag down other technical development. The big question remains: Who is going to pay for this research?



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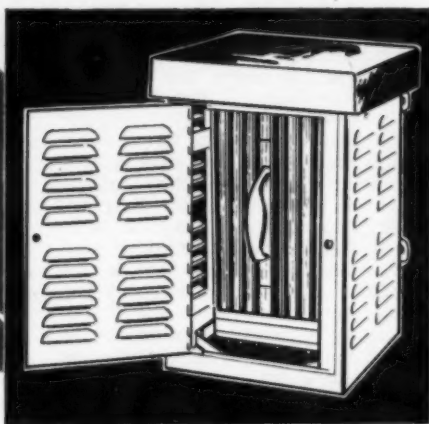
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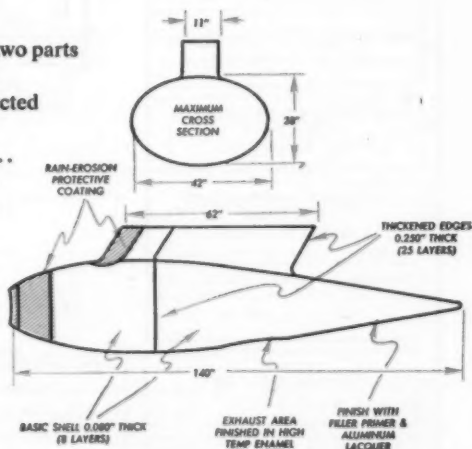
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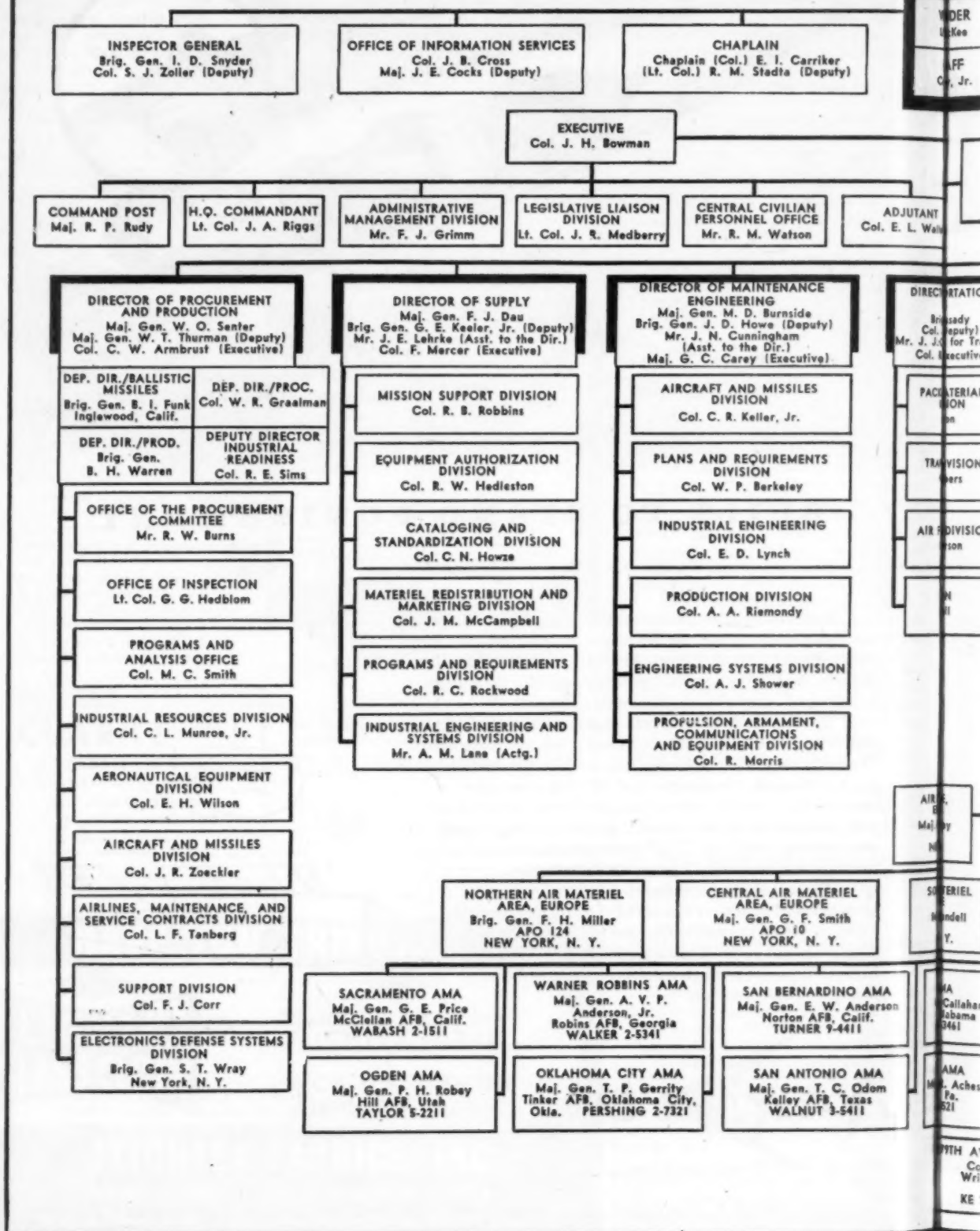
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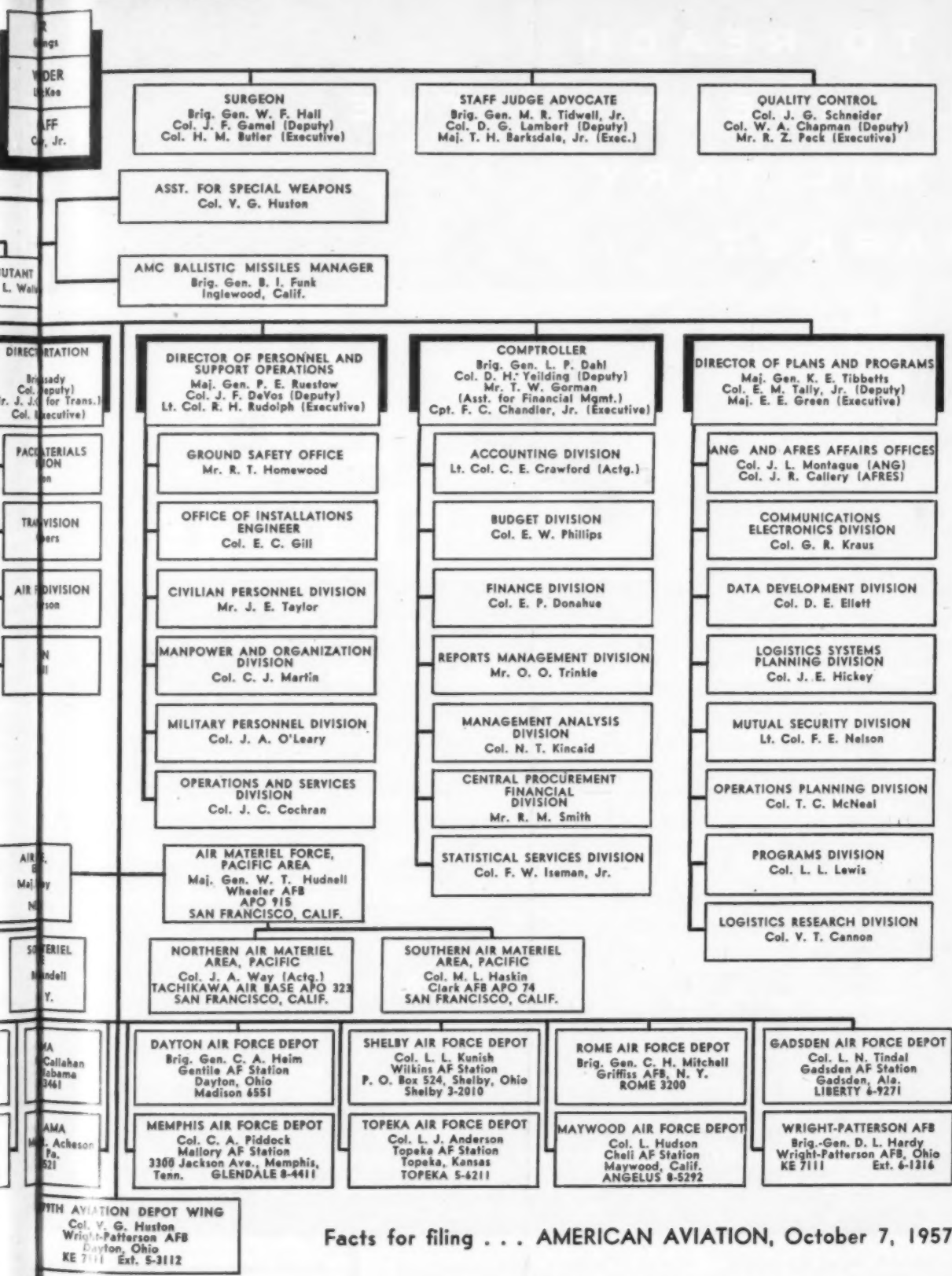


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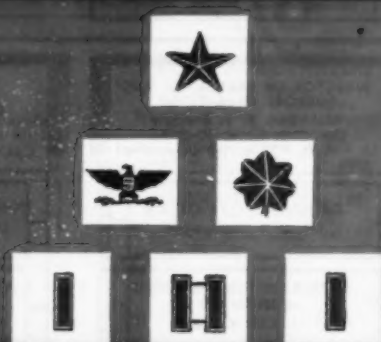


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Russia uses mobile landing and communication aids

by Henry P. Steier

LATEST INFORMATION on air traffic control electronics being used by the Russians shows heavy dependence upon mobile equipment to handle the expanding Soviet transport traffic.

From a source behind the Iron Curtain **AMERICAN AVIATION** has obtained characteristics of some typical equipment being used to handle traffic in approach and terminal areas under bad weather conditions, and some general comments on its performance.

According to AA's informant, surveillance and ground control approach radar is being used at Soviet airports serving civil air traffic, and the fields are equipped with instrument landing systems.

The radar equipment, portions of the ILS, and a very high frequency automatic direction-finder system used as an aircraft identification aid, are mounted in vans.

Reportedly the primary radio aids to navigation in en route areas are fixed LF/MF beacons operating in the frequency range of 150-1,300 kilocycles. These are supplemented by fixed distance measuring equipment said to have a range of about 100 miles at 13,000 feet altitude and 50 miles at 3,000 feet.

Most navigation is carried out with an automatic radio compass identified as the ARK-5.

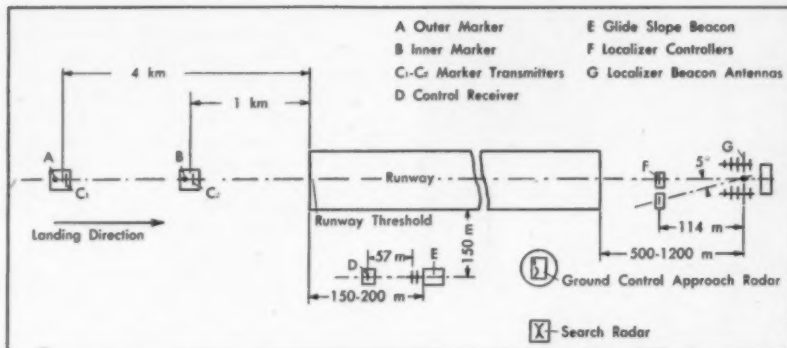
The distance measuring equipment operates with an SD-1 airborne receiver-transmitter which interrogates RD-1 ground transponder equipment operating at about 670 megacycles.

The DME is pulse operated and can serve up to 45 planes simultaneously. If more than that number interrogate the ground system it automatically shuts down until the load is decreased.

Number of aircraft which the Soviet DME can handle is about the same as the U.S. system. However, the handling of overload is different in the U.S. Here, excessive interrogations reduce the transponder sensitivity to prevent replies to aircraft operating near fringe reception distances.

Two types of localizer systems are in use. An older type KRM-1 or the new KRM-2 systems are installed at 500-1,500 kilometers (492-3,937 feet) from the end of the runway and operate at 108.3-110.3 megacycles.

A phase comparison method is used to indicate deviation from the runway course. In the older system a central antenna mounted at the end of the runway sends out a carrier which



LAYOUT of electronic landing aids used at Russian airfields. Radar, localizer, glide slope and communication equipment is located in vans. A van (not shown) is the control center for landing and takeoff operations during IFR conditions.

is amplitude modulated with a subcarrier of 10 kilocycles. This subcarrier is then modulated at 60 cycles per second.

On both sides of the central antenna are beam antennas of the Yagi type which direct the main beam. Modulation oscillations of the side antennas are opposed in phase.

During flight a deviation off-course shows up as a phase difference and causes a cross-pointer instrument on board the aircraft to indicate course deviation.

The 60 cps modulation is done with mechanical modulators and the modulation is observed on the ground with a cathode-ray oscilloscope.

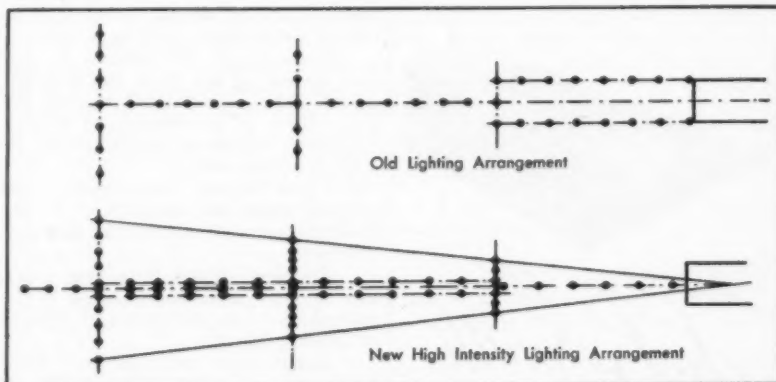
The later KRM-2 model has replaced the central non-directional antenna with a directional Yagi type similar to the side antennas. These all have

a dipole, reflector and four directors.

The Russian glide slope system is mobile and operates on one of three quartz crystal stabilized frequencies in the 300-mc region. This beacon is located from 150 to 200 meters (492-656 feet) aside from the runway area and the same distance from the runway threshold.

Two antennas are used to direct the glide slope beam. The "main" antenna has a half-wave dipole and a reflector. The other antenna has two half-wave dipoles with angle reflectors. All of the antenna elements are covered by a protective housing.

Glide slope angle is adjustable between 2 and 3.5 degrees. Operating conditions are observed with an apparatus located about 90 feet from the antenna system. If there is an angle shift of about 0.2 degrees from the

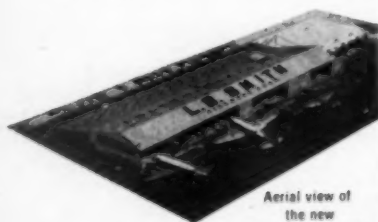


LAYOUT OF LIGHTS in old (top) and new (bottom) Russian approach lighting systems. Old system used fragile low-intensity lamps. New system is similar to Calvert system and uses high-intensity lamps.



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desired setting the beacon automatically shuts down. The shut-down takes place within 3-15 seconds of the angle shift.

The glide slope system operates by 90- and 150-cycle modulation of the carrier frequency. To determine position above or below the beam during a landing amplitude of modulation is measured.

Marker beacon transmitters used by the Russians are similar to those in use outside of Soviet areas and operate at 75-mc with modulation frequencies of 400, 1,300 and 3,000 cycles per second. The modulation code is somewhat different than the International Civil Aviation Organization standard and corresponds to 6 dots per second and 2 dashes per second sent alternately. On board an aircraft this gives both an aural and a visual signal as the aircraft goes over the markers.

The power output used by the Russians for all elements in their ILS system is about twice that used in other countries.

Radar aids

The Russian search and approach radar and ground communication system has been identified as RSP-4. This is a portable system mounted in three vans. In each van there is a transmitter, receiver and antenna array.

These units are located alongside the runway. The search and landing radars are in separate vans and operate near 10,000 megacycles. The search unit has two antennas which face 180 degrees from each other.

One search antenna is used for low-elevation scanning and the other for high-elevation scanning. Transmitter power is periodically switched from one antenna to the other. The whole unit rotates at 30 rpm.

The landing radar system is identified as PRL-4. It is located near the edge of the runway.

Viewing apparatus for search and landing radar signals is located in a takeoff and control van. Three separate cathode-ray tubes are used for viewing search radar signals at maximum ranges of 3.7, 12.4 and 21.7 miles. There is no electronic generation of range rings on these scopes.

Exact range and azimuth for aircraft shown on the three scopes is obtained with a mechanical reading device. There is no method of erasing fixed-echo signals to permit display of moving targets only.

Video signals from search and landing radar are transmitted to the control van over a cable at low frequencies.

To view signals from this radar, two separate cathode-ray tubes in the control van show elevation and azimuth of landing aircraft.

Range, flight path and glide angle references are gated electronically on the screens of the landing radar indicators. Reportedly aircraft in the very close range zone near final touchdown

cannot be seen on the indicators. Also, sharpness of the blips leaves much to be desired.

The Russians are apparently on a par with the U.S. in use of a means of identifying civil aircraft picked up by their search radar. They used an automatic direction-finding system which operates on VHF frequencies and provides supplementary information to the search radar display that permits more positive identification of blips on the screen.

Located in a van, positioned near the end of a runway where possible, the VHF-ADF operates at 108-136 mc. It locates direction of an amplitude modulated signal sent from the aircraft.

The received signal is sent to a 12-inch cathode-ray display tube located in the control van. The signal is synchronized in azimuth to positions of blips on the search radar viewing screens.

When a controller wishes to identify an aircraft he asks it to send a voice communication. The received signal causes a "strobe" signal to shoot out from the center of the cathode ray tube screen through the blip which represents the answering aircraft. At the same time the controller can hear the voice signal through a loudspeaker system.

What this system achieves is similar to that of the secondary-radar transponder now undergoing limited trials in the U.S. without, however, the automaticity, capacity and exactness of the transponder operation.

Use of an ADF supplement to radar was proposed in the U.S. by the Radio Technical Commission for Aeronautics Special Committee 31 in 1948 as part of the "transition period" ATC then envisaged. At that time the Air Force was trying the VHF-ADF.

Recently, AMERICAN AVIATION learned, CAA purchased a number of VHF-ADF for installation as an adjunct to Bendix Radio ASR-3 radars being installed by CAA. According to a CAA spokesman plans call for installation of 60 VHF-ADF systems. Twenty have been commissioned in the past six months.

The CAA system uses an ADF antenna electrically rotated by a motor-driven goniometer. One of the systems is in operation at the Washington National Airport.

Control tower

Some control of air traffic in the terminal area is handled by the control towers at Russian airports. In comparison with western airport facilities these are very simply equipped and arranged. The towers have no built-in heating or air-conditioning facilities.

Three tables in a typical glass-enclosed tower face the runway areas. One table carries switches for landing and airport lighting, hazard lights and radio landing aids.

Other tables carry indicating apparatus showing operating condition of

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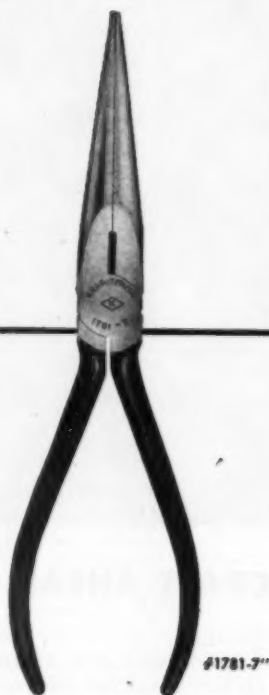
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the ILS system and controls for brightness of landing lights. The lights can be varied in five steps.

A panel has exchange switches for telephone communications and air traffic situation records. There are also instruments for showing wind velocity and direction, barometric pressure and time.

All radio communication is recorded on magnetic tape. This is a single-track system capable of using a five-inch reel of tape.

The control van operator appears to be responsible for all aircraft movements during the landing and takeoff phases. Communication between the tower and the control van is maintained at all times. Apparently the tower acts as a secondary visual surveillance post to keep the control car informed.

Heavy dependence on mobile equipment to handle terminal area traffic probably indicates that this equipment was designed for military operations and has now been brought into use on a stop-gap basis to serve the

needs of civil operations which have grown quickly.

There are indications that specifications for Russian landing aids have been applied to satellite nations. One report says that Lufthansa planes which operate into Prague, Czechoslovakia must carry two different ILS systems so that the Russian system installed there can be used, as well as ICAO standard system used elsewhere in Europe.

Lighting of landing and taxi runways is said to be deficient relative to U.S. standards. In general lights with non-directional beams and low intensity are used. All switching and control of light levels takes place from the control tower.

Two systems of landing light arrangement are used. Until recently a parallel arrangement of lights on each side of the runway threshold area was used. However, a new system of high-intensity lights is planned. This is similar to the Calvert system. Brightness of these lights can be adjusted in five steps.

General Precision Lab shows Doppler navigator; first unit will be used on Pan American DC-7

First public demonstration of a Doppler navigator was given by General Precision Laboratory, Inc., which exhibited its model PC-221A RADAN (Radar Doppler Automatic Navigator) to newsmen at the Westchester County Airport, Pleasantville, N. Y.

GPL said it is producing the PC-221A for airlines' trials. The first unit will be supplied to Pan American World Airways for use on a DC-7 over the North Atlantic route October 15. Details of arrangements for supplying other airlines have not been worked out, the company said.

The PC-221A is a modified version of the military APN-102 system developed by GPL. Weight of the navigator is 89 pounds. It provides ground speed and drift angle.

In its present form the GPL unit has a combined antenna-transmitter package and a $\frac{1}{2}$ ATR frequency tracker box. Total tube complement is 74, of which some are soldered-in and plugged-in subminiature types.

Equipment characteristics for airline Doppler systems have not been finalized. At the last meeting of the Self-Contained Navigation Aids (SCAIDS) subcommittee of Arinc's Airlines Electronics Engineering Committee in Los Angeles, a draft characteristic was developed for the sensor portion only of a Doppler system.

However, a number of points still require study before full airline industry agreement is reached on further development of sensors. These devices must satisfy system requirements of different airlines and airframe manufacturers' objections to some structural arrangements and, at the same time, enable early use of know-how in the

Doppler field accumulated by equipment manufacturers.

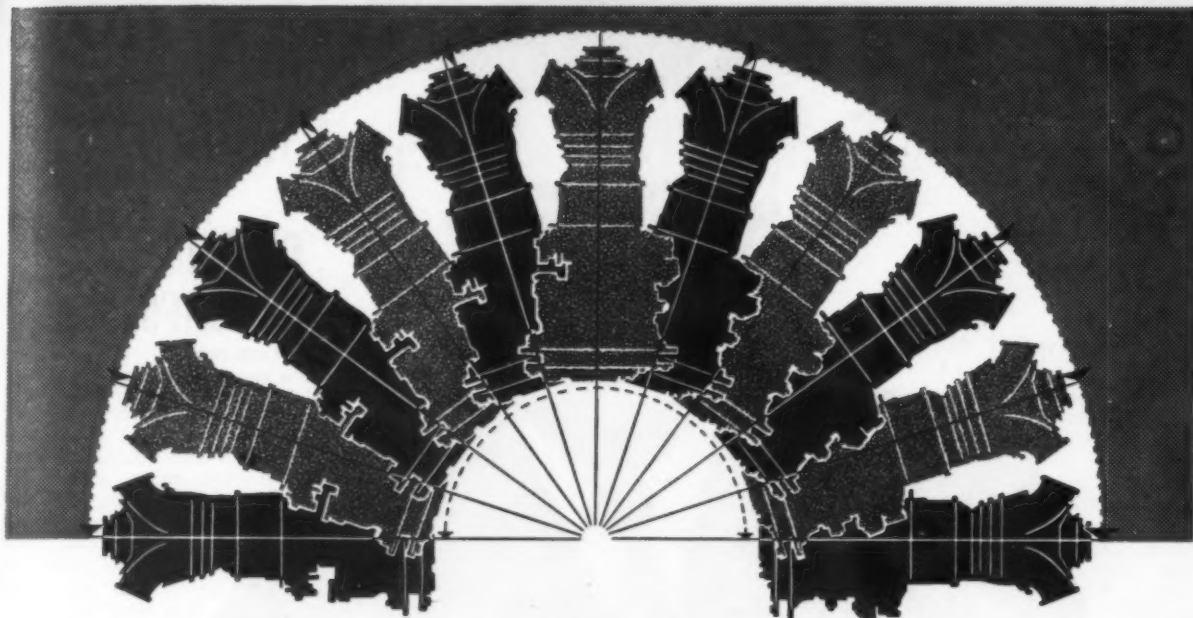
One aspect expected to cause considerable discussion is whether the transmitter and antenna should be built as one unit or separated by removing the electronics to a point inside the aircraft for greatest service and maintenance simplicity.

Opinions of various parties on this issue is not clear. The SCAIDS subcommittee has called for separation of the units. Douglas Aircraft Co. reportedly is opposed to running a long waveguide from transmitter to antenna which would be needed for efficient operation if the units were separated. Some equipment manufacturers feel the system will be more complicated if the receiver, antenna and transmitter are separated.

Other problems are expected in obtaining authorization to use certain frequency bands (1) for SCAIDS operation on a worldwide basis; (2) for determining interference between pulse and CW systems proposed and (3) for relative performance of different systems under fog or cloud conditions.

Among the manufacturers which have announced plans to produce airline Doppler navigators are Bendix Radio, British and Canadian Marconi and Decca Navigator of England. Bendix plans a prototype model in 18 months. Deliveries would start six months later.

The Marconi system being planned reportedly presents a size problem, since it is the largest of the systems thus far proposed. Decca plans a system combining Doppler signals and Decca hyperbolic navigation signals to drive the Decca flight log.



DESIGNERS WELCOME THE NAPIER GAZELLE

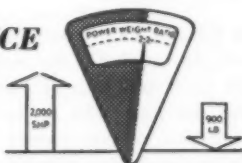
'Any angle' installation gives greater freedom

Napier's Gazelle offers a welcome break to 'tied' helicopter designers. This rugged free-turbine engine can be mounted on simple supports in the helicopter structure UPRIGHT, HORIZONTALLY, OR IN ANY POSITION IN BETWEEN.

This 'any angle' installation relieves the designer of many accepted limitations. It also gives him more opportunity to make proper use of fuselage space—valuable space which should, after all, be used for payload accommodation.

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The Gazelle has an impressive power/weight ratio. Originally designed for a power output of 1,260 s.h.p., it is now well on the way to developing 2,000 s.h.p. for a weight of 900 lbs.—a ratio of 0.45 lb./s.h.p. By removing the need for clutches, cooling fans, etc., the free turbine arrangement knocks pounds off the weight of the transmission mechanism.



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The Bristol 192—chosen by the British Royal Air Force—is powered by two Gazelles.

And when the time for overhaul comes, economical speedy maintenance is assured by the Gazelle's essential simplicity and the 'unit' principle on which it is built.

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This principle means that Gazelle components and assemblies are interchangeable—and easily accessible. Reduction gear, free turbine, compressor turbine and combustion system, compressor and accessories can all be replaced as self-contained, individually tested assemblies. The metering control unit can also be replaced as a rig-tested unit needing only minor adjustment.

The Gazelle is the most recent addition to the range of gas turbines made by D. Napier & Son Limited (London). Further information will gladly be supplied by J. C. K. Shipp & A. Gaultier, Suite 909, Dupont Bock Building, 1346 Connecticut Avenue N. W., Washington 6, D. C. Tel.: Dupont 7-2123 and 7-2226.

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\$67 million hinges on CAB capital gains ruling

Board must decide whether 29 subsidized airlines may retain profits from sale of 408 old planes

by William V. Henzey

TWENTY-NINE subsidized United States air carriers have a total of 408 airplanes to sell which they hope will bring \$174,625,000 on the open market. Those same carriers are committed to buy 308 jet, turboprop or advanced piston-engined replacement aircraft which will cost them \$620 million.

From the money gained from the sale of the 408 old planes, the carriers will realize a net profit, or capital gain, after the 25% Federal tax, of \$67,276,000. Even though that is only about 10% of the amount needed for the replacement aircraft, the airlines may have to hand it over to the government as an offset against their subsidy.

If they are forced to hand it over, many of them may wipe out their subsidy. If they are unable to buy the replacement aircraft, however, they may be wiped out themselves.

Thus it is that the subject of capital gains has assumed a No. 1 priority at the Civil Aeronautics Board and is on the "pending business" calendar of Congress when that body returns to Washington in January.

On April 6, 1956, CAB instituted an investigation to determine if it

should recapture capital gains from subsidized airlines in all cases. Previously, if an airline was on a so-called "open" mail rate, or one subject to retroactive adjustment, CAB recaptured such gains.

For example, if a carrier was entitled to \$1 million in subsidy for a given period and had \$1 million in capital gains in that period, CAB would offset the gains against the subsidy.

However, carriers on "closed" or "permanent" mail rates were permitted to retain capital gains. The potential policy inherent in the current investigation is recapture by CAB at any time, irrespective of the mail rate status of the carriers.

Bill coming up in Congress

Congress, on the other hand, has considered legislation for the past two years which would require CAB to permit the retention of gains from aircraft sales provided the monies are earmarked for new equipment purchases. If Congress should pass such a bill, the CAB proceeding would be more or less meaningless.

But CAB is speeding its complex

investigation along and is now believed to be aiming at a final decision before Congress takes up the bill in January. Conceivably, if CAB hits a "middle-ground" in its final decision, Congress may decide the legislation it is considering is unnecessary.

Such a middle-ground may have appeared on the horizon late last month in the CAB case when Examiner Paul N. Pfeiffer ruled that airlines should be permitted to retain capital gains from aircraft sales on a temporary basis.

Essentially, the proposal is designed to permit use of such funds in making down payments on new aircraft. The funds would eventually be paid to the government in the form of a reduced investment base and lower depreciation charges.

If Pfeiffer's theory can be generalized, it might be put this way: The airlines need capital gains, with some exceptions, to arrange for financing new aircraft. If the new aircraft is as efficient as the carriers contend, they should earn enough to permit eventual payment of the funds to the government on an installment-type basis.

To put this theory in proper focus, the positions of the parties must be noted. The airlines, most of whom are represented by Washington attorney James M. Verner, argue for full and permanent retention of the profits from aircraft sales. CAB's Bureau of Air Operations wants immediate and full capture by the government.

Pfeiffer thus would satisfy the airlines to the extent that the money would be available on a loan basis and the CAB to the extent that the government would get the money over the long pull. He would disagree with the airlines that they should retain the \$67 million permanently and would disagree with the CAB staff on immediate recapture.

To clarify this complex and highly-significant problem, Pfeiffer traced the replacement of a single aircraft through various steps, using Pacific Northern Airlines as an example. In August, 1947, PNA purchased a DC-4 for \$138,338. It was modified for an additional \$196,521, bringing the total cost of the plane to \$334,859.

As of September 30, 1956, the book value of the plane had been writ-

Following shows the aircraft that 29 subsidized U.S. air carriers will sell and those to be purchased in the forthcoming re-equipment program.

(Available for Sale)

Number	Type	Value of each
25	DC-6B	\$1,750,000
16	DC-6	1,375,000
8	L-049 Constellation	900,000
26	B-377 Boeing	1,000,000
33	DC-4	550,000
7	Martin 202	350,000
36	Convair 340	550,000
9	Convair 240	475,000
248	DC-3	125,000

(To Be Purchased)

Number	Type	Cost of each
32	B-707	\$5,750,000
25	DC-8	6,250,000
14	L-188 Electra	2,350,000
15	V-810 Viscount	1,256,000
25	DC-7C	2,700,000
13	DC-7B	2,425,000
2	DC-6	1,375,000
23	F-27	750,000
45	Convair 240	475,000
9	F-1 Safari	450,000
5	Pioneer	200,000

ten down through depreciation allowances to \$77,907. At the present time, according to the record in the CAB case, the plane has an estimated market value of \$550,000. Thus, if PNA sells the plane, there would be a gross capital gain of \$472,000 or a net after taxes of \$354,000. The replacement of the DC-4 by a Lockheed Electra would cost \$2,350,000.

Normally, insurance companies and commercial banks will lend up to 75% of the value of the equipment to be purchased. On this basis, PNA would need \$587,500 for its 25% down-payment. If the new law under which the government guarantees loans up to 90% is utilized by PNA, the carrier would need \$235,000 for the 10% down-payment. To meet either of these down-payments, it would have only the \$77,907 residual value of the DC-4, unless capital gains can be used.

Raising of the additional down-payment money, without use of capital gains, "might prove to be unobtainable in the case of smaller airlines such as PNA and the local service carriers," Pfeiffer reasoned. They would have to resort to additional debt capital in order to obtain the necessary cash to make the larger debt possible.

Also, because of the need for maintaining a debt-equity ratio which would not impair their credit status, the carriers cannot look upon government-guaranteed loans as a complete solution.

How industry would gain

Pfeiffer's conclusion is that, despite the existence of the new loan law, the capital structure of the industry would be better protected if the carriers were allowed at least temporary use of the capital gains for purposes of enlarging down payments on the purchase of new equipment.

But while the examiner's proposal would appear to offer at least partial advantages to the smaller lines, it was not advanced to benefit the largest carrier party to the case, Pan American World Airways.

Pfeiffer said Pan Am "does not appear to 'need' retention of capital gains in order to re-equip. . . . Total book value of its fleet as of September 30, 1956, was \$131 million. The airline proposes to obtain 17 DC-7Cs and 44 Boeing and Douglas jet airplanes at a cost of \$316 million by the end of 1960. Net capital gains from the sale of part of its present fleet are expected in the neighborhood of \$20 million."

If the temporary retention and installment-type payback plan were made applicable to Pan Am, Pfeiffer said the airline would be paying back \$2,857,000 annually, assuming a 7-year depreciation life. But, he added, "Pan Am will earn \$26,640,000 on its new equipment compared with only \$11,790,000 on its present aircraft or an increase of \$14,850,000, more than five times the amount of annual reduced depreciation attributable to capital gains." Thus, he

avored annual recapture of PAA's capital gains to avoid "an unjustifiable enrichment of this carrier at the taxpayers' expense."

Pan American puts its position this way, however: It will need \$145 million of new money for its re-equipment program if it is permitted to retain capital gains and \$171,500,000, if such gains are captured by CAB. In order to limit debt to 45% of its total capital, considered a desirable ratio, PAA needs to raise \$37 million in equity capital, leaving \$108 million to be obtained by borrowing.

Needed: \$63.5 million

If all the needed capital is borrowed, PAA's capital structure would consist of 55% debt and only 45% equity. If capital gains are confiscated by the government and all new capital were borrowed, the structure would be

62% debt and 38% equity. In order to limit debt to 45%, \$63.5 million in new equity money would have to be obtained, a sum "almost as much as the total amount secured in Pan American's 30-year history," according to Pfeiffer.

With the depressed market price of its stock, PAA feels it will have difficulty in raising the \$37 million of equity capital needed without the capture of capital gains. To raise \$63.5 million which would be needed if capital gains are captured would be virtually impossible, PAA argues.

Thus are the battle lines drawn and the financial fortunes of a major segment of the U.S. airline industry riding again on an expedited CAB proceeding. The case, of course, does not affect the unsubsidized segment of the industry which may employ capital gains as it sees fit.

CAB staff blocks permit for Argentine airline

Civil Aeronautics Board staff is attempting to block issuance of a foreign air carrier permit to Transcontinental, S.A., an Argentine carrier, until the Board can explore relationships between Transcontinental and California Eastern Airlines.

Bureau Counsel Robert L. Taylor urged that his waiver of exception to an examiner's report be rescinded and the case held up pending Board consideration of the interlocking relationships case, which is now under way.

Taylor had originally waived his right to exceptions last June when Examiner Ferdinand D. Moran recommended a three-year permit for Transcontinental between Argentina and

New York via Sao Paulo, Rio de Janeiro and Caracas.

Taylor contends his waiver was "on the understanding that if the permit were granted, operations under the agreement with Cal Eastern would not commence until the Board had approved the agreement or disclaimed jurisdiction over it." Taylor changed his mind when Transcontinental advised CAB that it intended to start service under the agreement as soon as the Board would issue the necessary permit.

The staff is concerned with Cal Eastern's 25% interest in Transcontinental, and the fact that Jorge Carnicero, Cal Eastern board chairman, is a director of Transcontinental.

TWA's overhaul base at Kansas City



TRANS WORLD AIRLINES has moved into big hangar of its new overhaul base and expected to roll in first plane last week. The \$25-million facility will have a jet engine overhaul building which, with tooling, will cost about \$12 million. Location is at Mid-Continent International Airport near Kansas City.



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*Jetstream is a service mark owned exclusively by TWA

CAB explains why it denied fare increase

CIVIL AERONAUTICS BOARD believes the depressed earnings and load factors of the domestic trunk airlines are of a short-term nature. It disagrees with industry arguments that rising costs can no longer be offset or absorbed by increased operating efficiencies.

These were the major points expressed in the official opinion and order implementing an August 6, 1957 press release in which CAB announced denial of the 6% passenger fare increase proposed by seven domestic trunks.

Board Chairman James R. Duffee and Member G. Joseph Minetti signed the majority opinion without qualifications. Members Harmar D. Denny and Louis J. Hector, though joining in the denial order, issued separate statements on their views.

Hector, CAB's newest and youngest member, said the airlines have not submitted evidence to back up their expressed need for higher fares to attract capital for jet re-equipment purposes. But he appeared to invite the industry to furnish "convincing proof" on that point.

Vice Chairman Chan Gurney disagreed outright with the majority action. He said the fare denial "puts U.S. civil aviation in a critical financial position."

The majority adhered to a 1953 policy in rejecting the interim fare hike. Basically, that policy calls for CAB to look at airline earnings over a reasonable number of years before either enforcing a fare cut or permitting a fare increase. Using an 8% return on investment as a yardstick, they said the airlines have averaged an over-all return of 9.1% since 1939. Thus, the majority termed it "clear that the historical earnings of the carriers for an extended period have been generous."

'Short-term factors' blamed

As for the future, they said "we must conclude from the record now before us that the present decline in reported earnings is attributable to short-term factors. . . . There is little doubt that the drop in earnings which the airlines have reported recently is due in large measure to the impact of new aircraft and new routes and the integration and developmental costs which ensue."

"Once these factors are absorbed into the carriers' operation," it was added, "it is reasonable to expect that their net effect will be higher earnings for the carriers receiving major route awards."

Majority did not feel the airlines had established that higher fares are needed to attract capital for the jet re-equipment program. Member Hector agreed on that point, but displayed an apparent desire to probe the question further.

In his separate statement, the

Florida Democrat said that a convincing presentation of the carriers' equipment programs and their related financing needs should encompass something like the following:

(a) long-range traffic projections, including traffic stimulation anticipated from the introduction of jet aircraft;

(b) aircraft purchase and disposal programs related to (a);

(c) financing plans necessary to accomplish (b);

(d) rate of return or level of earnings necessary to accomplish (c);

(e) passenger fare levels necessary to accomplish (d); and

(f) evidence that the proposed increased fares are compatible with the traffic projection with which the planning begins.

"There are, of course, many different forms in which these matters could be adequately presented to the Board, but to my mind this has not been done in this record," Hector said.

"I cannot feel," he concluded, "that the presentation of traffic projections and financing and equipment plans would be an undue burden on the carriers. . . . If an emergency fare increase is justified . . . to finance . . . these programs, the Board must require convincing proof that these programs are reasonable and economically and financially feasible."

Bridging the gap

Hector's views appeared to bridge the gap between the violently opposed positions of the majority and Vice Chairman Gurney.

Gurney said he thoroughly believes the requested increase of 6% is mandatory under the Board's responsibility to develop, maintain and keep a healthy civil air transport industry. "A financially strong industry," he continued, "is not only necessary to meet the ever-increasing needs of the traveling public and the demands of the users of air mail, but also to assist during a national emergency in the defense of our country."

"Increased operating costs and lowering margins for legitimate return on investment make it impossible for the air industry to compete with other important industries for necessary capital to complete its re-equipment program, totaling in excess of two billion dollars. The situation created by this denial of the small 6% increase puts United States civil aviation in a critical financial position."

"The majority has not in my opinion met its responsibility; in fact, the overall need is so urgent, its decision may be calamitous to the industry, some parts of which may be damaged beyond repair because of further delay (conservatively estimated to take from eight to twelve months) in meeting this emergency problem head-on."

Denny, meanwhile, concurred in

the fare increase denial but said he does not "necessarily" agree with some of the reasons and conclusions set forth in the majority opinion.

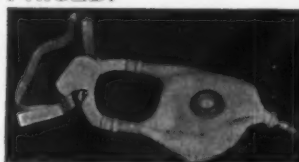
"I considered the question that faced the Board in this investigation is whether or not an emergency exists and interim relief is required pending disposition of the General Fare Investigation," he said. "Accordingly, my decision herein is based solely on a consideration of the evidence from this viewpoint."

Significantly, although the majority's decision was in accord with the position of the CAB staff, the majority did not rely substantially on the exhibits prepared for the case by the staff.

Those exhibits, through adjustments to forecasts submitted by the carriers, had the industry making whopping profits this year despite the fact some of the carriers were even at that time operating in the red.

Also significant is the fact that CAB avoided any ruling on the controversial depreciation item on which its staff sought to establish a new policy. Board deferred that question for consideration in the General Fare Case in which hearings are scheduled to start November 18.

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SAS wants San Francisco as stop on Polar route

Scandinavian Airlines System has applied to Civil Aeronautics Board for a permit of unlimited duration for its pioneer "polar route" service and for other permit amendments, including the addition of San Francisco as a co-terminal with Los Angeles.

Pan American World Airways and Trans World Airlines have been granted polar routes this year.

SAS said the new U.S. service will dilute traffic from its original service and "avers that it is entitled to continue to participate in that market on

a fair competitive basis. The designation of San Francisco as a co-terminal on the transpolar route of SAS will accomplish this fair objective."

The present three-year permit for polar service, held by the Scandinavian carrier, was issued on October 21, 1954, and is due to expire October 30. This permit authorized service between the co-terminals Stockholm, Oslo and Copenhagen, an intermediate point in Greenland and the terminal Los Angeles. The new proposal provides for service between the co-terminals Stockholm, Oslo and Copenhagen, intermediate points in Greenland and Canada, and the co-terminals Los Angeles and San Francisco.

CAB dismisses Slick complaint against American

Slick Airways' complaint which accused American Airlines of unfair competition in the airfreight field has been dismissed by CAB. The dismissal action was voted by Chairman Duffee, Vice Chairman Gurney, and Member Hector with Member Minetti dissenting.

CAB majority said the case does not involve "a course of regular and frequently recurrent activity allegedly in violation of the Act . . . the Board is of the opinion that the matters alleged do not involve a sufficiently specific and substantial public interest to warrant further action by it at this time."

Slick's January 1957 complaint charged American with sending two letters to the shipping public which "falsely represented . . . that it was to the interest of the public to abandon the services of Slick and other all-cargo carriers."

Dismissal does not preclude Slick from filing a new complaint, or CAB's right on its own initiative to "investigate such activities on the merits should there be a recurrence in the future."

EAL begins nonstop service between N. Y., Mexico City

Eastern Air Lines last week began first nonstop service by a U.S. carrier between New York and Mexico City. EAL is running one DC-7B roundtrip daily.

American Airlines plans to start Chicago-Mexico City nonstop service via Ft. Worth/Dallas and San Antonio at the end of this month.

Meanwhile, Guest Aerovias Mexico, S. A., has acted under the new provisional air agreement between Mexico and the U.S. by applying to Civil Aeronautics Board for a foreign air carrier permit that would include service between Mexico City, Miami, Bermuda, The Azores, Lisbon, Madrid, Paris and London.

Northwest asks permanency for Anchorage route

Northwest Airlines has applied to the Civil Aeronautics Board for permanent status of its so-called "inside route" between the U.S. and Anchorage, Alaska. Application is in line with new legislation authorizing permanency for the States-Alaska certificates of Pacific Northern Airlines, Alaska Airlines and NWA.

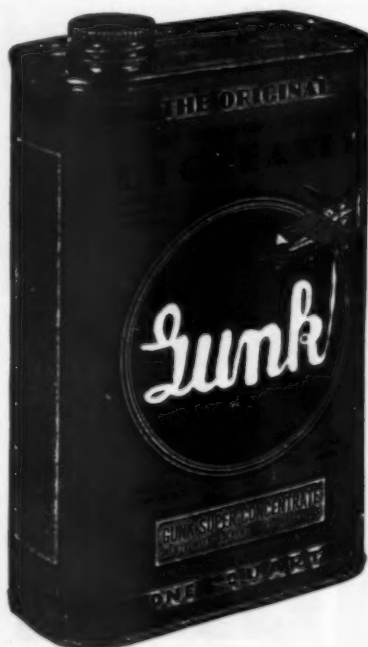
The certificate, previously on a temporary basis, will authorize service between the co-terminals New York and Chicago, the intermediates Minneapolis/St. Paul and Edmonton, Alberta, Canada, and the terminal Anchorage, Alaska.

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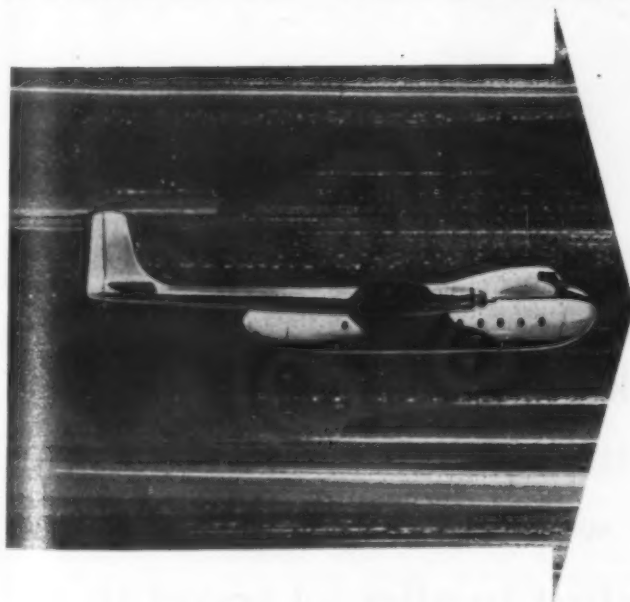
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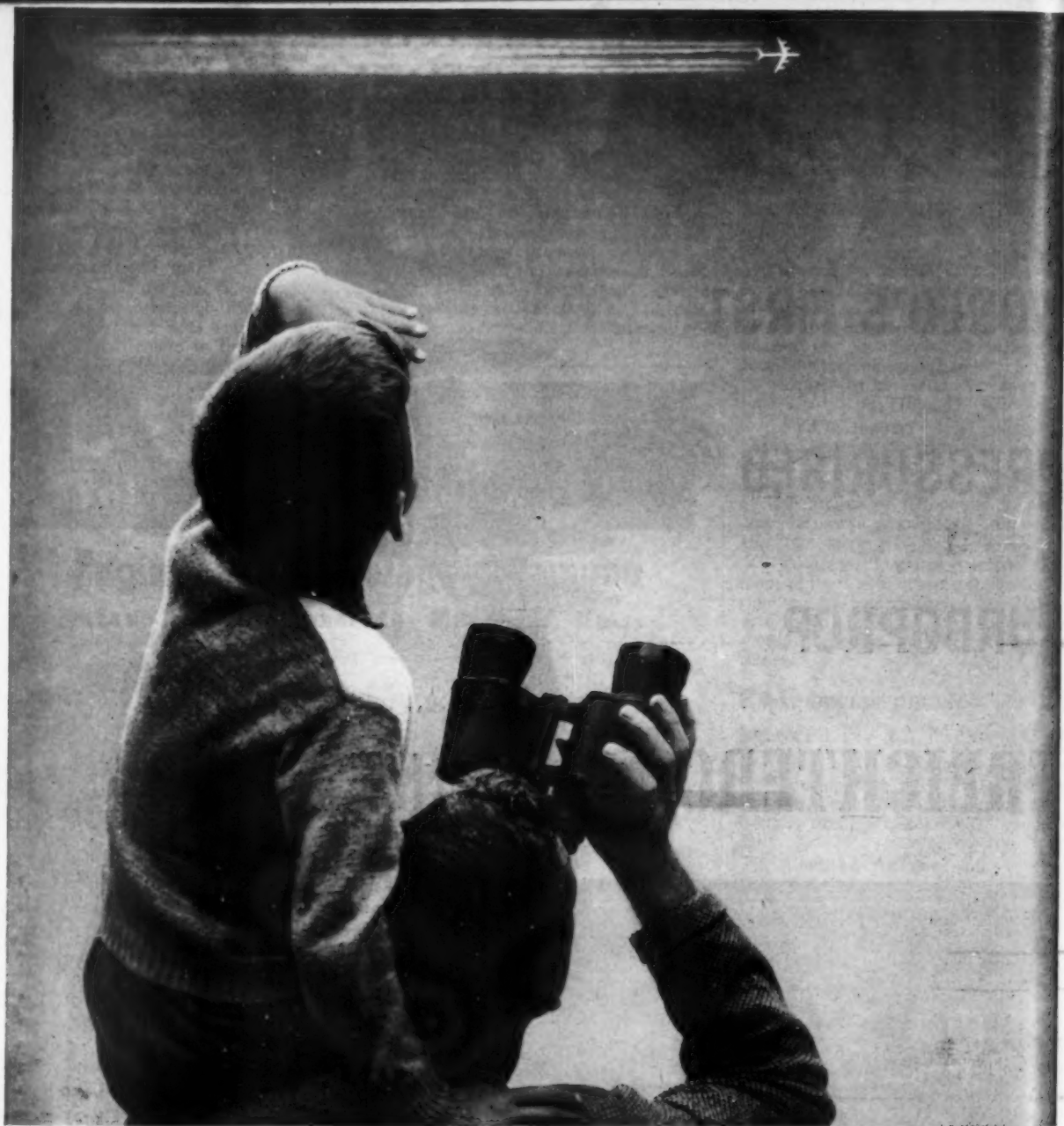
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TRANSPORT TRENDS

The explosive U.S.-France bilateral situation may erupt this month. France threatens to ban polar flights of U.S. lines from Paris unless Air France gets a polar route to California. CAB member G. Joseph Minetti visits Paris next week to confer with French government officials in an effort to solve the problem. Meanwhile, Pan American and TWA have started polar service to Paris, but under a temporary authorization which the French may withdraw momentarily. If no solution can be found, complete termination of reciprocal services of U.S. and French carriers could result.

United Air Lines has decided on the medium-range transport it will buy to replace its fleet of more than 50 Convair 340s. But UAL won't reveal its choice until it has explored the financing possibilities.

Domestic airline industry for the first time is split widely on the granting of a 10% discount on first-class fares for military personnel traveling on official business. At stake is a market now averaging between \$45 million and \$50 million a year. Eight lines (American, United, TWA, Western, Mohawk, Bonanza, New York Airways, Los Angeles Airways) withdrew the discount on Oct. 1. The 19 remaining carriers have CAB permission to continue the discount through next June.

Military is indignant because most of the travel involved was over the routes of the three transcontinental lines that dropped the discount. A retaliatory move could see diversion of some of the business to railroads or larger non-sked airlines.

Discount has been in effect since 1949, although CAB always contended it was discriminatory. Board now says the reasons that permitted it to overlook discriminatory aspects in the past may no longer exist. It has launched a general investigation which it hopes to complete next June.

Freight forwarder opposition may lead to CAB suspension of domestic airlines' proposed 10% increase in specific commodity cargo rates, scheduled to become effective Oct. 13. CAB last month permitted a similar increase in general commodity rates. But most air cargo business is at the specific commodity rates and CAB is expected to take a harder look at the rate increase affecting that business. Forwarders contend the increases are greater, percentagewise, for higher volume shipments and thus tend to cut the profit margin which keeps the forwarder in business.

Look for stepped-up pressure to push permanent certification for all-cargo carriers through Congress next session. When the bill comes up again, the Transport Workers Union, for one, will lobby for an amendment covering international cargo lines. Observers pin part of the blame for the bill's failure this year on a late demand by the international carriers to be included. Senate-passed bill covered only four domestic lines. Seaboard & Western and Aerovias Sud Americana requested inclusion, reportedly ran into resistance, and the bill languished in the House Commerce Committee.

TWA is swinging back toward more and more emphasis on first-class service. The company, which several years ago went all-out to expand its coach operation, will boost winter domestic first-class capacity 40% over last year. International capacity jumps 109%. First-class sections of transcontinental nonstop Lockheed 1649A Jetstreams are being equipped with 31 sleeper seats (no extra fare). Each flight will carry three cabin attendants. Incidentally, United Air Lines, which in August performed a world's record 518.5 million passenger-miles, operated 44.7% coach, 55.3% first-class. In same 1956 month, its passenger-miles were divided 41% coach, 59% first-class.

INDUSTRY

Northeast defers acceptance of controversial Britannias; BOAC starts transatlantic proving flights

by Anthony Vandyk

Controversy over the Bristol Britannia boiled up when Northeast Airlines decided to defer taking delivery of five of the British turboprop transports until next fall.

News of the decision came just as El Al set Dec. 1 as the starting date for scheduled transatlantic operations with Britannias. The Israeli carrier, which recently increased its Britannia order to four aircraft, is starting a route-proving program which will bring its first Bristol transport to New York Oct. 19.

British Overseas Airways Corp., which began a series of transatlantic proving flights last month with its first long-range Britannia, does not plan to put the turboprop transports into scheduled service on its Atlantic routes before early 1958.

Northeast's decision resulted, in the words of President George E. Gardner, because "the manufacturer . . . has been unable to make deliveries to Northeast in time for the 1957-58 Florida season." He explained that "rather than cancel the five-plane order, Northeast has agreed to postpone delivery of the Britannias until the fall of 1958, thus retaining its position as first in line among domestic carriers to operate the Britannia."

Negotiating for other planes

Meanwhile, Northeast has canceled the banking arrangements it made to finance the British planes and is currently negotiating for "suitable new four-engine aircraft for immediate delivery." AMERICAN AVIATION understands that Northeast will probably get some DC-7Cs to supplement its fleet of 10 DC-6B coach aircraft on the Florida run this winter.

Gardner has expressed disappointment over the Britannia delay but has emphasized that Northeast still wants the aircraft. "Our contract is firm provided that the plane is certificated," he said.

Certification requirements have been the main factor in delaying delivery of Northeast's Britannias. The first of the five planes flew this summer from Short Bros. & Harland's Belfast plant and was flown to the Bristol factory at Filton for incorporation of the modifications required by CAA. These changes include a new gear, revision of the cockpit, and numerous time-consuming detailed modifications.

Incorporation of all these changes, several of which are considered ac-

ademic by the British, has taken much longer than anticipated. The first Northeast Britannia will not be ready to start its flight-test program until November, the month the airline hoped to have all five of its aircraft in service in the U.S.

Paper work and the certification test program of the No. 1 Britannia for Northeast might take up to three months, in the estimate of Bristol officials. Hence it became clear to all concerned late this summer that there was no chance of the aircraft being in service in time for the start of the Florida season.

BOAC pleased with Britannia

BOAC has expressed interest in operating the five Northeast Britannias until the U.S. carrier is ready to take them. (However, Gardner has indicated Northeast would prefer to get new planes off the Bristol line in their place.) The British airline is anxious to have as many Britannias as it can get in service as soon as possible.

Despite the "teething troubles" encountered with the Britannia 102s which entered service starting in February, BOAC is basically pleased with the aircraft. At the moment it is getting a utilization of nine hours daily out of each of its Britannia 102s which are being used on the routes to South

Africa, Australia and the Far East.

The much-publicized engine icing trouble has still to be overcome even though it has occurred infrequently since BOAC started scheduled service with the Britannia—only 13 occurrences were reported in the course of 3,800 flights.

Peter G. Masefield, managing director of Bristol Aircraft Ltd., emphasizes that the problem, though "difficult and frustrating," is not a hazard and never has been. No engine has ever been out of action for more than ten seconds and there has never been any loss of altitude.

Three methods of solving the Proteus engine's icing problem are currently being tried: application of heat on the rear wall of the inlet duct; multiple ducts, and flush intakes. Bristol

Report Bristol-Hughes deal getting hot

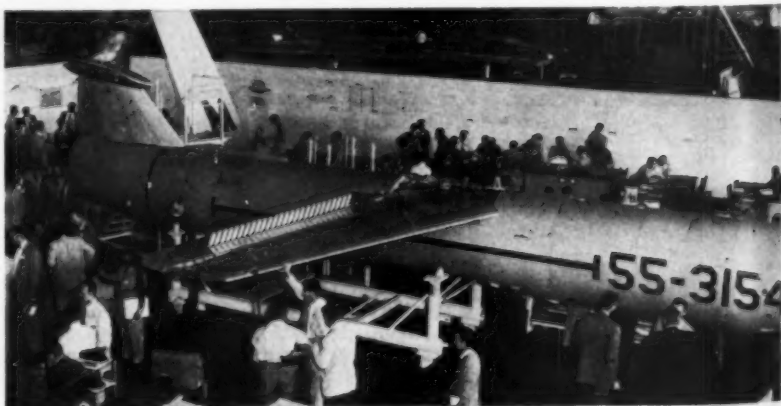
Negotiations between Bristol Aircraft Ltd. and Howard Hughes for the supply of Britannias to Trans World Airlines are "pretty hot," according to an official of the British company.

Peter G. Masefield managing director of Bristol Aircraft Ltd., used these words at a press conference in New York when he also revealed that a minimum of 15 aircraft are involved. He described Hughes as "a mercurial character."

is confident that one of these fixes will finally clear the trouble.

Bristol's emphasis that the icing condition does not constitute a serious problem is shared by the Air Registration Board, supported by the British government. An ARB full certificate of airworthiness was granted to the long-range Britannias late last month and at the same time the overhaul

Martin partially unveils new Matador



NEWEST MATADOR pilotless bomber, the TM-76 (formerly designated TM-61B), was developed by the Martin Co. under an Air Force weapon system contract. In addition to missile, system includes launcher, prime mover, test equipment and ground-handling equipment. TM-76 is 44 ft. long (against 39.5 ft. for its predecessors) with 22.9 ft. wing span (compared with 28.8 ft. for TM-61A). It also has a new guidance system, is more maneuverable and has folding wings.

life of the Proteus was extended from 850 to 1,050 hours.

Nonetheless, operators have been advised to avoid prolonged flight at over 16,000 ft. under climatic conditions where the icing problem may occur. The areas where occurrence is possible is roughly in the band on 1,000 miles either side of the equator and then only under certain well-defined climatic conditions.

Thus, the engine icing problem should not affect the transatlantic operations to be started in December by El Al nor the Mexico City-New York flights to be inaugurated about the same time by Aeronaves de Mexico. The Mexican carrier will get its first Britannia this month and the second in November.

Both Israel and Mexico, incidentally, certificate aircraft reciprocally with Britain. Hence the ARB certificate of airworthiness automatically enables the Israeli and Mexican carriers to operate their Britannias in passenger-carrying service. A similar reciprocity arrangement will enable Canadian Pacific Airlines to operate its Britannia fleet which will be delivered starting early next year. Cuba also will permit the British certification to allow Cubana to fly Britannias later in 1958.

In 1958 Bristol and Short Bros. & Harland will be producing three Britannias a month between them. This means that by mid-1959 all of the 72 Britannias now on order will have been delivered. Hence an all-out sales campaign is now being waged to extend the production run.

Deferment of the Northeast order will not help Bristol's salesmen but successful operation of the turboprop aircraft into New York by El Al, Aeronaves, BOAC and Cubana could well mark the beginning of a new series of purchases of the "Whispering Giant."

Airlines to test infrared proximity warning system

Flight tests of an infrared proximity warning system will get under way soon as a mutual program set up by the airlines and Aerojet-General Corp. which developed the system.

At the recent Radio Technical Commission for Aeronautics meeting in Washington, D. C., Frank C. White, Air Transport Assn., told the assembly four airlines will participate in the evaluation.

First proposal to try its system was presented by Aerojet at the July meeting of the ATA committee on collision avoidance (AMERICAN AVIATION, Aug. 12, p. 63).

White would not name the airlines that will participate. He said availability of aircraft of different types would govern final distribution of the tests. First report on results is expected early in 1958.

One product of the tests will be information on desirability of the present draft specification which calls for

First Lockheed Electra nears completion



NOW STRUCTURALLY COMPLETE with only its four turboprop engines missing, the prototype Lockheed Electra 400-mph transport is nearing rollout stage at Burbank, Calif. First commercial version is in fuselage mating dock, is scheduled to go into service with Eastern Airlines in fall of 1958. Prototype is scheduled to fly in January. Engines will be Allison 501-D13 turboprops turning Aeroproducts Turbo-propellers.

a minimum detection range of two miles. Operational experience is expected to show whether five- or six-mile range is desired, or whether that range will result in too many alerts.

Haggerty named editor of Aircraft Year Book

James J. Haggerty Jr., well-known military writer, was appointed executive editor of the 1957-58 Aircraft Year Book, official publication of Aircraft Industries Assn., Robert H. Wood, editorial director of American Aviation Publications, announced.

AAP will publish the Year Book in January in a new format. Eleanor Thayer Miller is managing editor. Haggerty's work on the publication during the next few months will not conflict with his status as a contract writer for Look magazine.

NBAA gives safety awards to 131 business pilots

National Business Aircraft Assn. last week presented million-mile and 500,000-mile flight safety awards to 131 business pilots, 43 of whom logged 1,000,000 miles or more. The 131 honored during NBAA's annual meeting in Denver represent 115,853,845 miles flown in business aircraft without damage to plane or injury to passengers.

NBAA's annual Meritorious Award went to Igor I. Sikorsky for his

outstanding contributions to the advancement of business flying. Joseph B. Burns, NBAA President, cited Sikorsky's pioneering efforts in three fields of aviation: multi-engined aircraft, flying boats and helicopters.

C.E.A. Brown, Ohio Director of Aviation, received the 1957 annual Business Flight Safety Award given by the Women's Aeronautical Assn. of Kansas, one of the highest honors bestowed for contributions to business flying safety. Brown has been flying since 1930 and has been a vigorous supporter of the Flying Green Cross national safety program. He was picked by the Air Force Assn. as Ohio's Aviation Man-of-the-Year in 1956.

Ballistic missiles cost to reach \$5 billion

Ballistic missile development will cost well in excess of \$4 billion and capital outlay for equipping a ballistic wing may be as high as \$1 billion, W. J. McNeil, assistant Defense Secretary, said in a speech before the Security Industrial Assn. at New York.

"Many billions of dollars will have to be invested in development of the ballistic missiles before our military services actually achieve operational capabilities," he said. "In fact, it is estimated that the cost of developing ballistic missiles to an operational state will be a good deal more than double the cost of developing the first atomic bomb."

Westinghouse develops high-temperature test facility able to reach 2,500°F in 12 seconds

The race for intercontinental ballistic missiles continues to accelerate development of supporting test equipment and facilities to help solve the tough re-entry problem. Latest in such test equipment comes from Westinghouse Electric Corp., which has devised a high-temperature test facility in Pittsburgh that the company says "can create heat conditions encountered by missiles and aircraft at least three times faster than standard systems now in use."

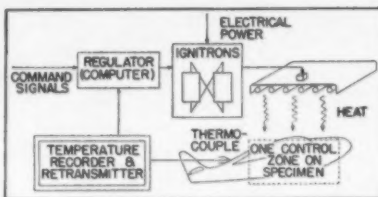
The facility is reported able to attain 2,500°F in 12 seconds. Banks of quartz infrared lamps are used as the heating source. Each lamp is rated at 1,000 watts, 240 volts but in many cases is operated at 440 to 480 volts.

By using induction heating equipment instead of the lamps, Westinghouse says it is able to have power inputs of 150 to 750 kw/sq. ft.

According to company vice-president A. C. Monteith, orders for the new test unit have already been placed by the Martin Co., Convair Div. of General Dynamics Corp., Bell Aircraft Corp. and Chrysler Corp. Missiles Operations Div.

The Martin facility will be used for structural testing on Project Titan and the Chrysler installation for the company's Jupiter and Redstone projects.

Heart of the test system is the regulator control. This unit, which is really a computer, interprets the command signals for a second sub-system, the ignitron control. The regulator control develops the command signal either



ELEVATED-TEMPERATURE structures test system.

(1) to regulate the heater to a given time-temperature schedule required by the aircraft; or (2) to regulate to a given power-required signal as developed by arbitrary aerodynamic input functions and surface temperature measurements.

The ignitron unit controls the amount of heat delivered to the test specimen.

A high-speed temperature recorder transcribes the temperature of the control zone of the aircraft or missile under test. At present, the temperature recorder is calibrated for thermocouples in the temperature range between —350°F and 2,650°F.



DISINTEGRATION of test specimen after four seconds' exposure to a bank of infrared lamps. Test facility is able to reach temperature higher than 2,500°F.

Cessna, Hertz outline plane-rental plan

The plane-rental plan developed by Cessna Aircraft Co. and Hertz Rent A Car will go into operation in November.

Under the plan, Cessna distributors will operate the aircraft and Hertz will supply the counter service and rental know-how accumulated through many years of car rental service.

Pilots who rent aircraft will be checked out the first time they rent a particular model. There will be no need for subsequent check rides in the type aircraft within a reasonable length of time. Credit cards used in the system will contain a pocket in the back to hold receipts for rentals as a means of documenting the check-out information.

Although the plan is designed primarily for pilots who don't own planes, plane owners may get cards for use when they are out of town and unable to use their own aircraft.

Cessna officials believe that the Rent A Plane plan will attract more interest in flying. Former pilots who are unable to own planes will be interested in the plan as a means to take up flying again, they feel.

In another move to get more persons interested in private flying, Cessna is studying a plan to hold training courses for potential pilots. Cessna dealers would conduct the courses. The training would be more thorough and cost more than the usual pilot training and would include instrument indoctrination.

Hughes may relinquish Atlas voting rights

Howard Hughes may relinquish his right to vote some 900,000 shares of Atlas Corp. stock acquired in the 1956 merger of Hughes' RKO Pictures Corp. into Atlas. Plan is for Hughes to assign his voting rights in the stock to a bank or trust company to be designated by CAB. CAB, in turn, would terminate an investigation launched last year to determine if Hughes, through his Atlas holdings, acquired the "power to control" Northeast Airlines.

Atlas, meanwhile, does not oppose the proposed assignment of Hughes' voting rights, but does not abandon its contention that Hughes had personally

promised Atlas head Floyd B. Odlum that he'd give Odlum a proxy to vote the stock. Hughes' attorneys would not concede that point during the CAB hearings.

Hughes' holdings in Atlas total approximately 10%, comparable to holdings of Odlum. CAB's interest stems from the fact that Hughes owns most of Trans World Airlines' stock and, since Atlas Corp. owns a majority interest in Northeast, Hughes conceivably could have the power to control two airlines at once.

If CAB approves terms of the proposed settlement, Hughes will have 30 days thereafter to execute and deliver an agreement assigning voting rights to a bank or trust company. He, of course, maintains all other rights with respect to the stock.

Northrop establishes new electronics division

A new operating division, Northrop Aircraft Inc., has been established by Northrop Aircraft Inc., to centralize all the company's activities in electronics, electro-mechanical and related opto-mechanical product areas. Dr. William Ballhaus, vice president and chief engineer at Hawthorne, will be general manager.

Whitley Collins, Northrop president, said the primary objective of the new division will be to meet company electronic contract commitments on schedule, but long-range plans call for development of new systems.

Government agencies seek to end National dispute

Federal Courts, the Department of Labor, National Mediation Board, Congress, Civil Aeronautics Board and possibly the FBI were all concerned at presstime with the complete shutdown of National Airlines, in effect since September 22. The shutdown stemmed from a stormy dispute between National and the Air Line Agents Assn.

Federal mediator Leverett Edwards continued meetings with representatives of the airline and union in an effort to get the airline back in operation. Meanwhile, National pressed damage suits in Federal courts in New York and Florida and also sought a contempt citation against the union in the Florida court.

The union, on the other hand, protested to Secretary of Labor James Mitchell. Four airlines sought to assume certain operational responsibilities of the shutdown airline. Details of the protest to Mitchell were not made public, CAB, handling the airlines' various requests to serve NAL's routes, stuck by its traditional policy of not granting such requests during a labor dispute.

The FBI was believed in the case when National said "federal authorities" were investigating alleged acts of "sabotage" to NAL's ground equipment at three cities.

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PAA achieves round-the-world status; Qantas next

by Anthony Vandyk

THIS IS CLEARLY the route expansion season for international airlines. Pan American and TWA have opened up their polar routes. KLM has started the first through-service between Houston, Tex. and Europe and has also inaugurated operations between New York and the Dutch Antilles. Canadian Pacific, having extended its Mexico City-Eastern Canada-Lisbon route to Madrid, is now trying to push this line further east to Rome and beyond. It would surprise no one if eventually it went right through to Hong Kong, making CPA a round-the-world carrier.

The inauguration of PAA's polar route has made PAA, at long last, a real round-the-world operator. True, previously it was possible to girdle the globe without leaving PAA aircraft but the link between the west coast and New York had to be accomplished circuitously by way of Latin America.

On January 1 TWA will be able to offer its passengers round-the-world schedules by extending its U.S.-Europe-Ceylon route to Bangkok and Manila. It will connect at Manila with Northwest's route back home.

Qantas Empire Airways plans to get into the round-the-world act in December when it will extend its trans-Pacific route on from San Francisco to New York and London. The British capital is the terminal of the long-established "kangaroo" route from Australia to Europe via Asia. Qantas, incidentally, may well be the first foreign airline to use jets on the North Atlantic. The present delivery schedules indicate that no other foreign airline will get U.S. jets before Qantas which is scheduled to receive its seven Boeing 707s starting May 1959.

What else is new? PAA is currently planning tentative dates for the inauguration of its newly authorized mid-

Atlantic service from Miami to Rome via San Juan, Lisbon and Madrid. Another important concession to PAA is its authorization to call at Madrid on the New York-Lisbon-Africa route.

SABENA Belgian World Airlines has just started service to three more cities—Montreal, Belgrade and Istanbul. It is interesting to note that this winter SABENA is maintaining the

timing of certain schedules introduced in the summer that permits a trans-Atlantic passenger westbound to avoid spending the night in the aircraft. By leaving Brussels at 12:30 P.M. local time, he is in New York after a non-stop DC-7C flight at 8:15 P.M. New York time. This is one of the few schedules across the Atlantic that do not necessitate flying through the night.

Australia moves to strengthen airline industry; will aid selected carriers, continue subsidies

The Australian airline industry now knows where it stands as a result of a statement of policy issued by the Australian government. The two major decisions taken by the government involve: (1) continuation of the policy of providing fair and equal competition for two—and only two—airlines on major trunk routes; (2) assistance to selected airlines for the procurement of DC-3 replacement aircraft; and (3) continuation of subsidies for air services in the country areas.

The government's statement of policy was prompted by the financial crisis which led Australian National Airways to sell out to Ansett Transport Industries, Ltd. Prime Minister Robert G. Menzies described this crisis as "symptomatic of the economic condition of the entire Australian air transport industry."

As a result of the government's policy statement and the revitalization of ANA, which is likely to result from its purchase by Ansett, the Australian Air Transport Industry's future prosperity seems assured. Most observers agree that it will be a good thing for the Australian government-owned

Trans-Australia Airlines to have competition from a more dynamic carrier than ANA has been recently.

Under the expansion program under way for ANA by Ansett, which will cost more than \$20 million, the purchase of four Lockheed Electras and seven Convair 440's is being consummated. These aircraft will bolster ANA's present fleet of four DC-6Bs, two DC-6s, eight DC-4s, fourteen DC-3s and three Bristol 170 freighters. TAA's fleet comprises eleven Viscounts (with two more ordered), two Convair 240s, four DC-4s, twenty-two DC-3s, and four DH Drovers. The airline has six Fokker F-27 Friendships on order.

TAA has been doing particularly well with its Viscounts but a recent decision by the Australian government to impose a duty equivalent to 6¢ a gallon on kerosene may affect the economics of the Vickers turboprop transport. Announcing the imposition of the levy on kerosene, Australian Treasurer Sir Arthur Fadden pointed out that in recent years airlines have been making increased use of aviation kerosene rather than gasoline on which Australia has a duty of 8¢ to 9¢ a gallon.

BRIEFS

English Electric P.1 twin-jet, Mach 2 fighter, will be armed with two 30-mm guns, two D. H. Firestreak missiles, long-range search radar and all-weather electronics, reveals Marconi, makers of the radio and nav aids . . . Short Brothers & Harland has designed a shock-resistant electric mechanical release for tail chutes to overcome the tendency for such mechanisms to jettison prematurely as the canopy deploys.

Italy's Macchi is now completing three MB. 226 jet trainer prototypes. They are

slated for flights between Nov. 1 and Dec. 31 . . . Spain's CASA is preparing to build a batch of 50 Dornier Do. 27 reconnaissance planes. The prototype of the German-designed plane was built in Spain. The Dornier plant in Germany is building a batch of about 500 Do. 27s . . . Hispano Aviacion, Spanish manufacturer, has received Spanish government orders for 40 HA-100 Triana and HA-200R Saeta trainers.

Rolls-Royce Avon RA 30 is rated at 10,000 lbs. sea level static thrust, the RA 18 at 11,300 lbs., and the RA 23 at 10,500 lbs.

Middle East Airlines has opened two all-cargo routes, each operated weekly

with York equipment: Beirut-Milan-London and Beirut-Rome-Basle-London. KLM Royal Dutch Airlines has substituted DC-7 Cs for DC-6Bs on its Amsterdam-South America route via the South Atlantic . . . SAS will operate one of its three Europe-South America services with DC-7C equipment, effective Oct. 6. The other two weekly flights will be operated with DC-6Bs . . . British European Airways and Czechoslovakia's CSA will reopen the London-Prague service, suspended for several years, in the fall . . . Trabajos Aereos y Enlaces, new Spanish independent, has signed with Hunting Percival for the supply of three President aircraft and has taken an option on a further two.

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WEST COAST TALK

by Fred S. Hunter

Lowdown on some higher-ups, proving they're human too

SOME PERSONALITIES: Ted Conant, senior vice president of Douglas, has the first dollar he ever earned. It's a silver dollar made in 1892 at the old Carson City mint, which he always carries with him in his righthand pants pocket. The coin is now a collector's piece, worth about \$5. . . . Terry Drinkwater, president of Western Air Lines, is a great story-teller, and, what's more, his stories are not only generally funny, but he most always has one you never heard before. . . . Noble Shopshire, director of contract administration for North American, plays the accordion, not like Lawrence Welk, but strictly for fun. . . . And Dr. Simon Ramo, vice president of Ramo-Wooldridge, can turn out a pretty fair tune on the fiddle if he's in the mood.

Hall Hibbard, senior vice president of Lockheed, is addicted to pin-stripe suits, and on him they look good. . . . Tom Lanphier, Convair vice president, plays golf in the 70s—some days, that is. . . . Jud Taylor, vice president and treasurer of Western Air Lines, is a rockhound. . . . Stan Shatto, WAL's vice president of operations, who started out to be a watchmaker, is still able to turn out a fast repair job on an ailing wrist-watch—or so we're told by Ken Smith, who admits, however, he's never let Shatto work out on one of his turnips. . . . Bill Whitehead, president of The Garrett Corp. is strictly a suspenders man.

Dan Kimball, president of Aerojet-General, will become a candidate for governor if some influential California Democrats have their way, but Dan probably will stick to the rocket business. . . . Harold George, senior vice president of Ramo-Wooldridge, is a member of the Beverly Hills city council. . . . Capt. Hoyt Vandenberg, son of the former Air Force chief of staff, is flight commander of an F-100 group at George AFB.

Latest addition to the Roy Marquardt family arrived at about the same time this summer that Marquardt Aircraft was opening its new Ogden plant, and was promptly named Michael Ogden, a gesture endearing Roy forever to the Ogden Chamber of Commerce. . . . Nat Paschall, Doug-

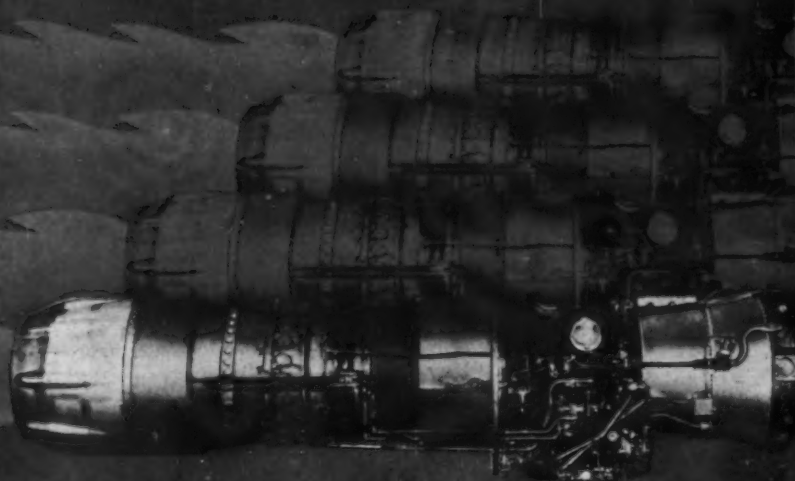
las vice president, named his son Boeing, but don't try to make a case out of it as Nat happens to be a stepson of W. E. Boeing. . . . Freight salesman George Cussen is one of those rare birds, a native Angelino, and if he had had the foresight to have bought property in the neighborhood where he was born he wouldn't be working for The Flying Tiger Line now; he'd own it.

Art Ayres, special representative for Pan American, belongs to two gourmet groups, the Chevaliers du Tastevin, which holds two dinners a year, and the Beverly Hills Wine & Food Society, which can't wait so long between drinks and meets monthly, but the rest of the time he sticks strictly to his diet. . . . Al Cline, Northrop public relations director, has a new 35-foot trailer and is all set to live it up week-ends at Newport Beach in the summer and Palm Springs in the winter. . . . Harvey Tafe, assistant to the vice president for military relations of Convair, lives in Santa Monica and commutes, so you can see why Art Kelly, Western Air Lines' vice president of sales, wishes there were more like him.

Two "Juniors" have everything their own way in Northrop's new International division, J. G. Nettleton, Jr. being corporate vice president in charge in Beverly Hills and Geoffrey Parsons, Jr. being vice president in charge in Paris. . . . George C. Ford, vice president of Norris-Thermador, was a crew chief for Western Air Lines back in the days when it was known as Western Air Express. . . . Ed Heinemann, chief engineer of Douglas-El Segundo, is a water skiing enthusiast and this, not worry, is what keeps him thin. . . . One of the great all-time stars of tennis, Maurice McLaughlin, is in North American's purchasing department.

Stanley Hiller, Jr., president of Hiller Helicopters, designed, built and flew his first helicopter before he even reached the legal age of 21. . . . Frank Harkins, chief process engineer at Solar, is a prolific writer of technical papers, one for the American Welding Society earlier this year having been his 35th.

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A terse report

For highly descriptive language and economy of words, telegrams filed by CAA field inspectors on aircraft incidents and accidents often reveal remarkable talents.

An example: Recently an airline cargo transport circled all by itself over the airport at Los Angeles for half an hour after the pilots had abandoned it. This didn't impress the CAA inspector much. He reported:

"Lost prop on takeoff run. Aircraft afire and in rotation. Stopped rotation at 10:10P"

Computers vs. engineers

The astronomical savings attributed to electronic computers makes one wonder how older aircraft managed to get designed without them . . . or why there could possibly be a shortage of such relatively slow-moving creatures as engineers. Without computers, Lockheed figures mathematical analysis of the Electra would have cost more than \$112 million—four times total Electra development cost to date.

Lockheed estimates 6.6 computer specialists do a day's work of 5,200 desk calculator operators . . . one-hour computer time is equivalent to 41,600 hrs. on the calculator . . . yet the computer costs only \$72,600 compared to \$1,386,000 for the building full of calculators it would take to do the same job.

Press corps pranksters

Some jokesters in the Pentagon press corps gave Army CID agents a bad time last month after a blackboard had been left in the press room following a special briefing. The newsmen covered the blackboard with mysterious-looking equations and mathematical symbols, marking the whole business "Top Secret" in big letters.

Alert security guards saw the blackboard, notified CID. Result: four agents arrived on the scene, began a microscopic examination of the press room. Matter was finally resolved by a hurried phone call to the chief of the Pentagon press branch.

The guilty pranksters were left wondering wistfully about contents of a letter dealing with the "incident" which the CID agents sent to the Army adjutant general.

Man still in demand

Story making the rounds of west coast aircraft industry may well express the feelings of many toward trends in automation. It tells of the large button to be displayed on the instrument panel of the 1958 line of autos.

Button will be of gold-anodized

aluminum, but will not be connected to any mechanical or electrical system of the car. When you push it, it'll push back—just to make you feel you're wanted!

Museum piece

The French recently sold West Germany a Junkers 52 for the grand sum of one franc (less than 1¢) for use as a museum exhibit at Munich, where it landed after an assignment with the French Air Force in North Africa.

Ironically, it was the Ju 52 above all other German aircraft which led to the occupation of France during World War II.

A sweet business

Curtiss-Wright Corp. has developed an ultrasonic chocolate-making machine said to turn out the same amount of sweet stuff in two minutes that it used to take several hours to prepare.

Off the record

Now hear this: We've been told (off the record, of course) that Navy is developing a very precise bombing-navigation system to avoid hitting targets that USAF's Strategic Air Com-

mand considers to be its "property." Rumor is the device will go into Martin's P6M long-range flying boat.

Industry talk . . .

It took three aircraft and three days for a group of top aviation people to make a scheduled overnight flight to a conference in Europe. Most embarrassed person aboard was a vice-president of the airline concerned.

Least embarrassed: officials of an engine company that did not make the powerplant of the aircraft concerned.

Airframe manufacturers often get the first news of a proposed re-engining of their products by reading the trade press. It happens quite often that an engine manufacturer's brochure boys work up a conversion project without consulting the airframe company concerned.

With present airline schedules and the increasing use of DC-7C and L-1649 equipment, a berth on an east-bound transatlantic flight is losing its attraction. The aircraft usually arrives at its European terminal five hours after dinner is served. The time differential makes the flight time look longer on the schedule than it actually takes to make the trip.

Portrait of a two smoke-stack jet fighter?

THIS PECULIAR-LOOKING two-stack coal-burning jet fighter isn't. It is an F8U-1 ready to be launched from an aircraft carrier. Art Schoeni of Chance Vought public relations shot the picture of the Crusader just as the carrier was "blowing its stacks." Result was something looking akin to Disney character.

BULLETIN FROM **BOEING**



BOEING KC-135 JET TRANSPORT-TANKER—now being delivered in volume to the Air Force. The KC-135 gives the nation's jet bombers and fighters virtually unlimited range—and brings refueling up to jet-age standards of efficiency, speed and altitude.



GLOBAL NUCLEAR WEAPONS CARRIER, the Boeing B-52 jet bomber, holds the round-the-world non-stop record: 45 hours, 19 minutes. Fastest, most advanced bomber now in service, the Boeing B-52 continues to spearhead the Strategic Air Command's long-range retaliatory defense force.



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OCTOBER

Contract flight schools may win long fight with Navy

by Lois C. Philmus

AERONAUTICAL TRAINING SOCIETY is again pounding at the door slammed by the Navy on contract primary flight training. But, with vigor renewed by the shrinking Air Force requirement, the group is bringing some stout battering rams into play. And, in the new Defense economy atmosphere, Navy resistance just may be wiped out by Defense and Congressional veto.

ATS' most powerful weapon—the two-year-old Heller Report—was buried under security stamps by the Navy since its receipt in December, 1955. But now the report has been declassified and released—following an appeal to Defense officials by ATS president Sam Solomon.

Thus, armed with its strongest argument—an independent report by a firm of management consultants—that use of the contract method would provide more efficient and economical primary flight training—Solomon has put the ATS case before Defense Secretary Wilson. And it's a persuasive one.

In a letter to the Defense Chief, ATS urged Wilson to "direct the Navy to make the transition as soon as possible to the contract method of conducting its primary flight school training."

"The Heller study concluded," ATS said, "that it would be highly desirable for the Navy to utilize the services of Air Force contractors with experience in the field of primary flight training. Since the organization and build-up of a contract primary flying school to peak efficiency takes time, we feel that an unprecedented opportunity is now available to the Navy to utilize the services of two or more primary flying school contractors who now find their services to be excess to the needs of the Air Force."

USAF discontinued the services of two of its nine contract schools at the close of fiscal 1957 and has served notice that a third at Hondo, Tex., would be phased out on June 30, 1958. Therefore, ATS pointed out, the Navy adoption of the contract method would now be "particularly timely and propitious."

However, the letter was merely the preface to ATS' chief offensive weapon—the Heller Report. The firm of Robert Heller & Associates of Cleveland, working under a \$40,000 Navy contract, following a three-month comparative study of the Navy's training system and the USAF contract system, concluded:

"Cost savings and other advantages which appear possible if the Navy utilizes contract schools for its primary pilot training program are attractive."

The report said there were "formidable problems" if the Navy tried to establish its own contracting "com-

plex" and recommended a step-by-step program to secure maximum benefits of such operation with minimum cost and effort.

1. Utilization of USAF facilities and training organization with the airmen "ideally" freeing two or more current schools for Navy use. Events since the study was made has brought this about by evolution. With the cadet input decreasing each year, USAF has already declared three facilities excess.

2. Two other possibilities—obsoleted by events—were to disperse Navy students among the Air Force cadets with a possible joint curriculum or for the Navy to commission some of the USAF contract schools to establish new bases.

3. Discontinue primary pilot training in the Pensacola Complex with the facilities either shut down or made available for other duty.

Heller based his recommendations on a basic conclusion that Navy transition to the contract method would result in savings of \$6,924,000 annually. The consultants maintained that the estimate was conservative at the time. They acknowledged, however, that lack of accurate Navy figures made cost comparisons difficult.

The Navy has maintained that the estimate of approximately \$7 million was high and says that management changes effected after the report have brought the comparative costs into line. Other conclusions in the study were:

Comparison of primary pilot training costs, U.S. Navy (per 1,000 students)

Account	Current monthly cost of present syllabus	Estimated monthly cost contract schools	Per cent of total current monthly costs	
			Current	contract schools
Payroll				
Officer students	\$ 193,500	\$ 193,500	8.75	8.75
Cadet students	96,000	96,000	4.34	4.34
Flight instructors	235,224	164,674	10.63	7.44
Flight instructor support	29,304	34,860	1.32	1.57
Academic instructors	12,992	7,072	.59	.32
Academic instructor support	2,770	908	.13	.04
Aircraft operations	29,900	25,520	1.35	1.15
Aircraft maintenance	134,285	133,334	6.07	6.03
Base support—residential	124,236	50,176	5.62	2.27
Base support—training	82,416	72,080	3.73	3.26
General administrative	21,922	14,832	.99	.67
Executive	50,328	32,691	2.27	1.48
Subtotal—Payroll Costs	<u>\$1,012,877</u>	<u>\$ 825,647</u>	<u>45.79</u>	<u>37.32</u>
Materials and Contract Services				
Gasoline, oil, and operating supplies ..	\$ 112,860	\$ 112,860	5.10	5.10
Aircraft maintenance materials	143,220	143,220	6.47	6.47
Aircraft engine overhaul	37,840	37,840	1.71	1.71
Aircraft frame overhaul	145,200	123,420	6.56	5.58
Aircraft destroyed	11,220	11,220	.51	.51
Base support—residential	23,739	11,739	1.07	.53
Base support—training	18,100	18,100	.82	.82
Administrative	4,340	4,340	.20	.20
Subtotal	<u>\$ 496,519</u>	<u>\$ 462,739</u>	<u>22.44</u>	<u>20.92</u>
Equipment				
Assigned aircraft	\$ 78,885	\$ 67,481	3.56	3.05
Support aircraft	8,366	7,759	.38	.35
Aircraft maintenance and operations ..	10,465	10,465	.47	.47
Base support—residential	19,664	9,723	.89	.44
Base support—training	14,102	14,102	.64	.64
Subtotal—equipment costs	<u>131,482</u>	<u>109,530</u>	<u>5.94</u>	<u>4.95</u>
Buildings and Land	<u>\$ 65,410</u>	<u>\$ 44,191</u>	<u>2.96</u>	<u>2.00</u>
Miscellaneous	<u>\$ 506,005</u>	<u>\$ 293,282</u>	<u>22.87</u>	<u>13.25</u>
Grand total	<u>\$2,212,293</u>	<u>\$1,735,389</u>	<u>100.00</u>	<u>78.44</u>

1. *Quality of flight training* at contract schools compared quite favorably with Navy system and was "quite possibly superior."

2. *Satisfactory military atmosphere* can be developed and maintained at contract schools but much room for improvement exists at both the Navy training center and at the majority of the contract schools.

3. *Employee relations* at the USAF contract schools are good, with the civilian instructors more "mature and experienced" than the Navy pilots pressed into instructors service.

4. *Contracting would increase* over-all military strength by freeing

Navy personnel to ease the current manpower shortage. ATS feels this has become more pertinent in light of the recent manpower reductions ordered by Defense.

But while the contractors have assumed the offensive in the renewed argument, the Navy is hardly on a cowering defensive. In releasing the study under Defense Department orders, the Navy simultaneously prepared its own position.

Navy officials say the conditions referred to "no longer exists or are substantially different." Utilization of the contract concept, the Navy men assert, would call for an overhaul of its entire

training philosophy. Primary training cannot be considered apart from the entire Navy program and transition to contract methods would seriously affect the basic flight-training segment. Weakness here, ATS spokesmen point out, is that the Navy commissioned the consultants to study only the primary phase, not the entire philosophy.

But the Navy's strongest point is that its shorter primary curriculum and its decreasing pilot input makes contracting impractical.

"The scope and size of that segment alone would hardly have supported the three separate schools indicated by the report as required for efficiency," the Navy declared. "Today, with the reduction in syllabus length and in student flow, it is obviously inadequate."

In further rebuttal, the Navy said: "Many items of purely military concern, to be taught only by military instructors, are intentionally introduced at early stages of training. To pull out these items so that a large segment of early training would be adaptable to civilian instruction would be circumventing the principles upon which the syllabus is based."

Adoption of contract training would force the closing of already existing Navy facilities at considerable expense with civilian facilities being used at "inefficiently low levels." Contract bases being discarded by the Air Force "would require not only substantial funds to bring them up to current standards but would soon require further expansion when jet trainers come into the picture."

Navy accepted the report's contention that contracts had a 50% cost advantage in the better utilization of personnel, but noted that corrective measures within the Navy program have produced cost reductions which "not only have paid for the cost of the report several times over but also have materially reduced cost differences derived from the personnel factor."

Thus, the Navy and contractor cases have again shaped up. Court of appeals is the Office of the Secretary of Defense, with Congress as the final "appellate court" for the contractors. In the past, the Navy's "Navy officer first, pilot second" concept has tipped the scales in its favor. But, with Defense hard-pressed to keep within its self-imposed spending ceiling, economy rather than military considerations are dictating the turn of events.

ATS members have a lot at stake. USAF pilot pipeline will be cut down to a new low of about 2,700 cadets a year shortly. Navy's input is around 2,900 a year now.

USAF and Army are strong for the contract method, with the Navy the lone holdout. Earlier this year, AMERICAN AVIATION has learned, an inter-Defense committee made up of service manpower representatives made a study of its own. Reportedly, the military committee made its findings along the same lines as the Heller group.

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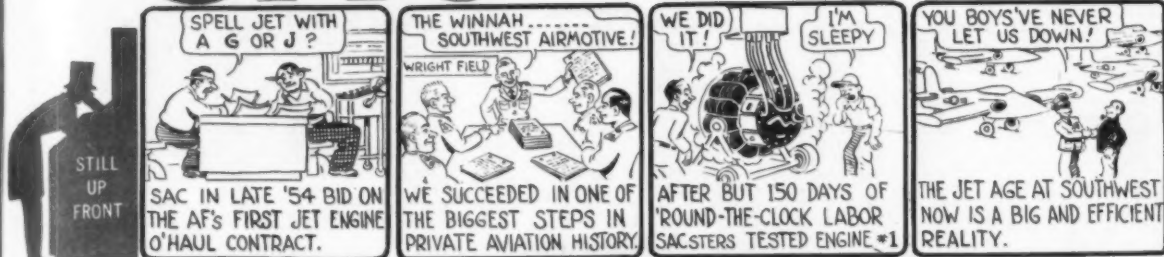
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1932 — A QUARTER CENTURY OF LEADERSHIP — 1957

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DIVISIONS: KANSAS CITY, KANSAS / DENVER, COLORADO

Summary of U.S. Airline Traffic for July 1957 vs. July 1956

Compiled by American Aviation Publications from Official CAB Data.

Airlines	Revenue Passengers			Revenue Passenger Miles			Total Ton-Miles Revenue Traffic			% Available Ton-Miles Used	
	1957	1956	% Change	1957	1956	% Change	1957	1956	% Change	1957	1956
DOMESTIC											
American	\$ 638,148	\$ 634,616	0.6	\$ 463,507	\$ 428,328	8.2	\$ 53,627,252	\$ 48,537,532	10.5	58.6	57.0
Braniff	166,132	134,287	23.7	74,448	55,463	35.2	7,973,171	5,959,706	33.0	45.5	49.1
Capital	341,263	239,350	42.6	130,003	81,537	59.4	13,517,012	8,479,174	59.4	45.2	40.6
Continental	75,773	56,594	33.9	37,206	21,539	72.7	3,554,379	2,262,250	70.4	46.5	44.2
Delta	216,689	182,444	18.5	106,958	87,436	22.3	11,560,743	9,444,592	22.4	55.6	51.3
Eastern	646,219	585,810	10.3	355,452	291,780	21.8	36,842,226	31,806,831	15.8	45.3	44.8
National	114,659	105,678	8.5	72,266	72,160	0.1	7,701,959	7,951,755	-3.2	53.5	64.3
Northeast	92,606	69,329	33.6	25,901	13,983	85.1	2,583,245	1,327,529	94.6	51.3	52.3
Northwest	128,651	116,138	10.8	95,080	82,633	15.1	10,518,072	9,303,848	13.1	54.2	52.8
TWA	413,150	336,498	22.8	372,015	296,076	25.6	39,255,089	31,541,014	24.5	61.2	60.7
United	573,406	541,760	5.8	457,963	398,383	15.1	51,868,715	45,144,009	14.9	58.5	58.6
Western	122,919	97,574	26.0	65,330	50,518	29.3	6,810,715	5,266,090	29.3	57.4	52.4
TOTALS	\$ 3,529,615	\$ 3,100,078	13.9	\$ 2,256,129	\$ 1,879,846	20.0	\$ 246,112,378	\$ 207,024,336	18.9	.....	.....
INTERNATIONAL											
American	\$ 13,270	\$ 12,372	7.3	\$ 10,043	\$ 9,208	9.1	\$ 1,386,927	\$ 1,264,805	9.7	70.4	65.7
Braniff	4,344	2,974	46.1	9,039	6,399	41.3	1,075,307	803,417	33.0	48.8	37.2
Delta	6,075	5,273	15.2	6,892	5,638	22.2	823,803	623,031	32.2	52.8	49.2
Eastern	29,378	24,771	18.6	42,745	35,515	20.4	4,544,778	3,874,258	17.3	66.6	69.1
San Juan	718	.....	.....	658	.....	.....	71,804	.....	.....	39.3	.....
Bermuda City	4,971	5,131	-3.1	3,888	3,980	-2.3	403,311	433,829	-7.0	55.3	61.7
National	7,335	10,526	-30.3	5,208	5,176	0.6	591,470	567,606	4.2	53.4	50.1
Northwest	12,542	11,544	8.6	72,240	22,703	218.2	4,432,110	4,049,297	9.5	65.2	71.1
Hawaiian	1,285	1,172	9.6	3,609	2,895	24.7	398,495	327,746	21.6	59.8	60.4
Panagra	12,268	12,557	-2.3	15,170	15,014	1.0	2,021,063	1,951,309	3.6	56.0	58.5
Pan. American	130,445	125,685	3.8	146,409	121,300	20.7	17,568,179	14,633,436	20.1	66.5	65.6
Lat. America	115,784	107,057	8.2	154,522	138,559	11.5	19,404,149	16,954,057	14.5	61.9	59.9
Pacific	27,492	29,096	-5.5	101,933	81,838	24.6	12,636,011	10,653,092	18.6	67.8	71.6
Portland/Seattle	1,619	1,547	4.6	4,781	4,156	15.0	527,839	483,147	21.9	49.2	59.3
Honolulu	9,102	9,127	-0.3	9,863	9,339	5.6	1,331,936	1,455,836	-8.5	57.5	61.8
Alaska	32,191	31,044	3.7	86,352	82,346	4.8	10,442,296	9,970,384	4.7	64.0	69.9
TWA	11,685	12,189	-4.1	29,007	30,258	-4.1	3,117,526	3,216,384	-3.1	71.3	76.3
United	576	.....	.....	896	.....	.....	98,814	.....	.....	39.9	.....
TOTALS	\$ 418,176	\$ 399,345	4.7	\$ 694,865	\$ 567,273	22.5	\$ 79,949,474	\$ 70,450,741	13.9	.....	.....
LOCAL SERVICE											
Allegheny	\$ 43,874	\$ 36,089	21.6	\$ 7,737	\$ 6,024	28.4	\$ 774,984	\$ 602,148	28.7	45.4	41.7
Bonanza	13,431	10,414	29.1	2,888	2,280	27.8	289,085	228,311	26.6	42.5	39.7
Central	11,456	8,003	43.1	2,227	1,531	45.5	227,975	157,420	44.8	31.2	28.3
Frontier	21,161	17,481	21.1	5,495	4,421	24.3	617,056	502,990	22.7	66.9	56.1
Lake Central	13,922	10,788	29.1	2,201	1,664	32.3	226,489	162,954	39.1	36.9	33.1
Mohawk	35,622	27,120	31.3	6,590	4,900	34.5	670,885	488,572	37.3	39.6	47.5
No. Central	61,754	51,255	20.5	10,331	8,388	23.2	1,038,962	847,191	22.6	47.7	46.2
Osark	35,178	26,481	32.8	5,873	4,096	43.4	604,290	415,594	45.4	42.9	34.4
Piedmont	37,414	26,207	33.3	7,932	6,904	14.9	796,810	695,033	14.6	57.4	51.3
Southern	18,412	15,565	18.3	3,328	2,759	20.6	337,325	285,259	18.3	38.2	39.6
Southwest	30,206	26,173	15.4	6,436	5,112	25.9	633,282	506,492	25.0	53.5	47.2
Trans Texas	22,140	18,492	19.7	5,056	4,251	18.9	528,806	448,864	17.8	40.8	35.3
West Coast	24,843	19,445	27.8	4,299	3,305	30.1	422,896	309,764	36.5	48.4	43.9
TOTALS	\$ 369,412	\$ 303,513	21.7	\$ 70,393	\$ 55,615	26.6	\$ 7,168,847	\$ 5,650,592	26.9	.....	.....
ENPLANEMENTS											
ALASKAN											
Alaska States ..	\$ 622	\$ 613	1.5	\$ 1,009	\$ 958	5.3	\$ 323,427	\$ 416,103	-22.3	42.2	51.3
Intra	6,049	6,455	-6.3	1,787	1,759	1.6	358,887	350,544	-34.8	49.6	51.7
Alaska Coastal ..	6,491	6,357	2.1	559	588	-4.9	65,500	69,055	-5.2	62.8	64.9
Cordova	3,324	2,088	59.2	714	354	101.7	356,416	251,118	41.9	47.5	61.4
Ellis	8,187	8,760	-6.6	446	445	0.2	51,267	50,930	0.7	67.0	68.3
No. Consolidated ..	3,158	2,685	17.6	929	843	10.2	192,977	163,607	-40.4	59.4	69.8
Pacific Northern ..	13,056	14,356	-9.1	13,577	11,304	20.1	1,878,142	1,635,827	15.1	69.7	69.8
Reeve	1,040	851	59.8	812	396	4.0	156,068	121,591	28.4	51.9	69.1
Wien	4,956	5,441	-9.9	1,821	2,237	-18.6	413,932	1,636,015	-74.7	67.3	94.8
TOTALS	\$ 46,883	\$ 47,406	-1.1	\$ 21,654	\$ 18,886	14.7	\$ 3,796,615	\$ 5,215,790	-27.2	.....	.....
HELICOPTER											
Chl. Helicopter ..	\$ 5,618	.....	.....	94.0	.....	.....	\$ 10,514	\$ 2,415	335.4	30.5	38.8
Los Angeles ..	3,219	1,815	77.4	115	67	71.6	16,296	11,672	39.6	62.9	50.6
N. Y. Airways ..	9,100	3,697	146.1	165	69	139.1	19,213	8,776	118.9	45.4	56.7
TERRITORIAL											
Caribair	\$ 21,760	\$ 16,515	31.6	\$ 1,587	\$ 1,152	37.8	\$ 171,979	\$ 107,520	60.1	66.7	61.5
Hawaiian	43,903	45,564	-3.7	7,054	6,464	9.1	711,034	673,654	5.5	55.3	57.3
Trans-Pac.	19,380	23,770	-18.5	3,523	3,041	15.9	256,863	242,500	5.9	55.3	53.9

BOOKS

Alas Rojas Sobre Espana. By Miguel Sanchis. Published by Publicaciones Espanolas. 67 pages.

A considerable amount of hitherto unpublished information on the role of the Loyalist Spanish Air Force in the Spanish Civil War is given in this small book. It lists the various aircraft operated by the Loyalists, including French, U.S. and British and Russian.

The performance of each aircraft is discussed and new light thrown on the air war in Spain. For students of air power it is well worth reading. One of the contributors was AMERICAN AVIATION's correspondent in Spain, Felipe Ezquerro.

An ABC of Aeronautics. By L. L. Beckford. Published by Pitman Publishing Corp., New York. 114 pages. Price, \$3.95.

Dictionary of terms designed to provide students and enthusiasts of aviation

with a comprehensive guide. Book contains technical definitions of value to many persons in the aviation industry.

Doctors in the Air. By Wing Commander Robert Maycock. Published by Thomas Nelson and Sons, New York. 145 pages. Price, \$3.75.

Book describes the research which has helped men survive at great heights and at transonic speeds, violent accelerations, parachute jumps and exposure. Author was one of first two RAF doctors to pass full wartime pilot training course.

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PEOPLE

Lt. Gen. C. S. Irvine, Air Force deputy chief of staff-materiel, Convair and Sperry Gyroscope Co. officials inspect secret navigation and guidance systems for the Convair B-58 supersonic bomber at Sperry's Carle Place facility, Mineola, N. Y. From left: A. C. Esenwein, vp-gen. mgr. Convair-Ft. Worth; Carl G. Holschuh, Sperry president; George S. Starke, Sperry vp-sales; Gen. Irvine, and Robert S. Edwards, Sperry B-58 engineering manager.



J. T. Wills (left), Washington, D. C., zone manager of Allison Division of General Motors, and **Stephen H. Rolle**, chief, powerplant branch, CAA, discuss model of Allison 501-D13 turboprop engine and Aeroproducts Turbo-propeller after engine had been approved by CAA for commercial airline use. Prop was approved earlier.

Right Hon. Aubrey Jones (at right below), Minister of Supply for Great Britain, with **A. T. Burton**, North American Aviation vp, on recent tour of NAA Los Angeles plant.



Guy Evans (left), well-known U.S. rep. for numerous foreign airlines, Los Angeles and **Jose F. "Pepe" Rojas**, dir. of pubrel for CMA (Mexicana), Mexico City, snapped informally by WWP with Minox.



Col. Robert R. Williams (right), president U.S. Army Aviation Board, receives Master Army Aviation Badge, from **Brig. Gen. Bogardus S. Cairns**, CO of Army Aviation Center, Ft. Rucker, Ala.



Man

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Roland
Andre

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Dr. M.

Raymond
Robert

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Airline

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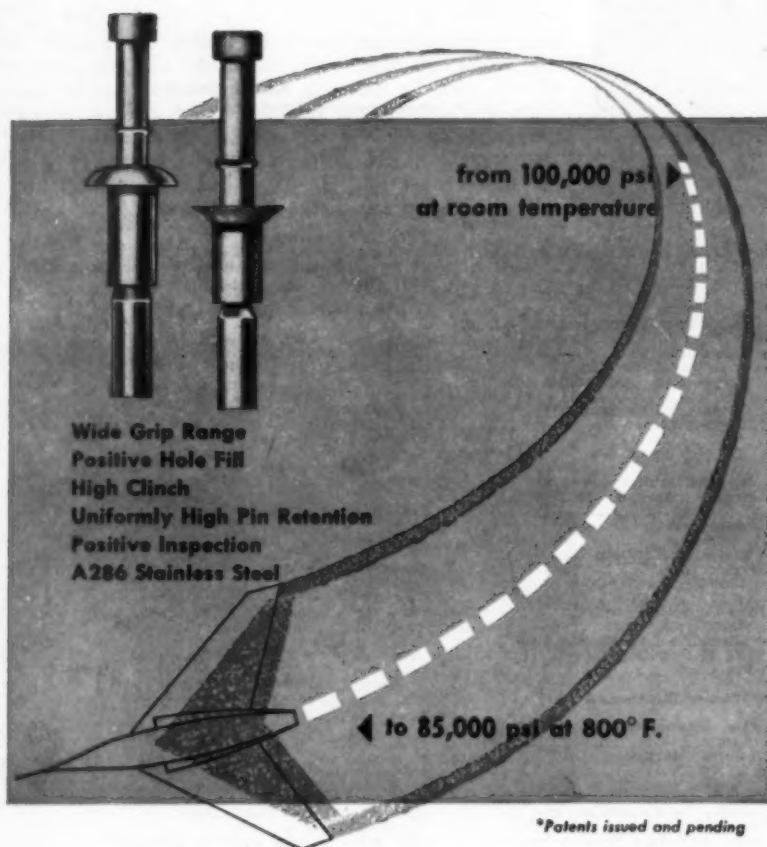
Manufacturing

Name	New Position	Former Position
John A. Swint	Pres., Vard Inc.	Ford Motor production exec.
Thomas P. Evans	Dir. R&D, American Machine & Foundry Co.	Deputy dir.
Charles S. Rockwell	Pres., gen. mgr. Ford Instrument Div., Sperry Rand Corp.	VP-gen. mgr.
John C. Abbey	Chief engr., Aeroquip Corp.	Product engr.
Alfred H. Grebe	Chief engr., Filitors, Inc.	Head of R&D
Herbert G. Lindberg	Gen. mfg. mgr., Ford Aircraft Engine Div.	Gen. production mgr.
Roland L. Guerlin, Jr.	Dir. spec. projects, Hufford Corp.	With Aircraft Industries Assn.
Andre Reichel	Dir. sales and service, Aeronautical Div., Pacific Scientific Co.	Sales dir., Kearfott Co.
William H. Balentine	Mgr. Instrument Div., Thomas A. Edison Industries	Asst. mgr.
Richard T. Orth	VP-planning, Sanders Associates, Inc.	VP and gen. mgr. Westinghouse electric tube div.
E. J. Doucet	Dir. adv. and pub. rel., Vickers Inc.	Adv. mgr.
Charles C. Tillinghast, Jr.	VP-foreign investments and plants, Bendix Aviation Corp.	Gen. counsel
Morton D. Weiner	VP, A.S.R. Products Corp. and chief operating officer, Com-Air Products Div.	Pres., Service Management Corp.
Laurance A. Cooper	VP-admin., Air Logistics Corp.	VP, American Bosch Arma Corp.
Robert E. Honer	Chief electronics engr., Convair-San Diego	Design specialist
Dr. M. W. P. Strandberg	Chmn. Tech. Advisory Committee, Advance Industries, Inc.	Asso. professor of physics, MIT
Raymond Davis	Asst. chief engr. for systems, BJ Electronics	Borg-Warner computer systems div.
Robert K. Stern	Pres., Mid-Century Instrument Corp.	VP and gen. mgr., Data Reduction and Automation Div., Fischer & Porter Co.
William E. Worcester	Mgr. aircraft sales, Pacific Coast Div., L.O.F. Glass Fibers Co.	Aircraft sales engr.
H. A. Steinherz	Mgr. engrg. and devel., NRC Equipment Corp.	Development engr.
Dr. Robert B. Costello	Asst. mgr., materials dept., Aerophysics Development Corp.	Project engr., Corning Glass Works
J. W. Womack	Service rep., Dallas Aero Service	Admin. asst. to VP-passenger service, Continental Air Lines
C. Hart Miller	Exec. vp. gen. mgr. and dir., Sierracin Corp.	VP-admin., Northrop Aircraft's Northrop Div.
Luther C. Ringer	Production mgr., Narmco Mfg. Co.	Chrysler Corp. West Coast Div.
James W. Andrew	In chg., Northrop Aircraft, Inc.'s Colorado Springs office	Brig. Gen. USAF
Richard K. Dickson	Gen. mgr., Trent Tube Co.'s Fullerton Calif. plant	Chief metallurgist, East Troy, Wis., plant
V. Fred Rayser	Adv. mgr., Cannon Electric Co.	Account exec., Perrett Co.
Alden C. Olsen	Sales mgr., Cannon Electric's Los Angeles Div.	Distributor sales mgr.
Murray C. Bartlett	Mgr. product engrg., B. F. Goodrich Aviation Products	Mgr. compound service and devel.
Thomas F. Watson	Sr. field engr., Arnoux Corp.	Chief of instrumentation, USAF Rocket Test facility, Edwards AFB, Calif.
Marvin Hobbs	Dir. mktg., Stewart-Warner Electronics	Dir. new product sales American Bosch-Arma Corp.
Lloyd F. Mauldin	Project engr., in chg. Pneumatics Group, Wm. R. Whittaker Co. Ltd.	Asst. project engr., AirResearch Mfg. Co.
Robert H. Vredenburg	Mgr., eastern operations, Marketing Div., American Electronics, Inc.	Mgr. sales, guidance systems, Aircraft Products Dept., General Electric Co.
Deibert L. Mills	Exec. vp. Federal Telephone and Radio Co.	Gen. mgr., Electric Motor Div., A. O. Smith Corp.
J. Vance Holdam, Jr.	VP-operations, Laboratory for Electronics, Inc.	Asst. to the pres., and dir.
Edwin D. Campbell	VP-admin. Laboratory for Electronics, Inc.	Treas. and dir.
John J. West	Tech. dir. locknut dept., Standard Pressed Steel Co.	Mgr. sales, Flexloc locknut products
Rowland H. Spencer	VP and gen. mgr. Aviation Div., Butler Overseas Corp.	Head, Aviation Div., Smith Kirkpatrick Co., Inc.
Wilson W. Petty	Chief engr., Titanium Fabricators, Inc.	Project engr., North American Aviation
William H. Starbuck	Sales mgr., Micronics Div., Elgin National Watch Co.	Sales mgr., American Brake Shoe Co.
Dale W. Cropey	VP-industrial divisions, Elgin National Watch Co.	Asst. to the pres.
W. G. Myers	Sales dir., Lockheed-Marietta	Dir. military sales
James Montgomery	Mfg. mgr., Adams-Rite Mfg. Co.	With General Metals Corp.'s Adel Precision Products
Stanley J. Zak	VP, Mandrel Industries, Inc.	Gen. mgr., Greenleaf Mfg. Co., a div. of Mandrel
Clare A. Mason	Pres. and gen. mgr., Century Engineers, Inc.	Exec. vp. Royal Jet, Inc.
Victor W. Myers	Gen. sales mgr., Ultradyne Engrg. Labs, Inc.	Mgr. sales dept.
Adm. Carl P. Sullivan (USN ret.)	Admin. asst. to dir. of development, Stavid Engineering, Inc.	Navy BuOrd
Frederick C. Durant, III	Asst. to dir. Avco Research Lab.	With Arthur D. Little, Inc.
John J. Flaherty	Asst. to gen. mgr. Atomics International	AEC Chicago office
Dr. Antonio Ferri	Head aero. engrg. dept., Polytechnic Institute of Brooklyn	Dir. special aerodynamics lab.
John R. Dickinson	Asst. to pres. Jeppesen & Co.	Asst. to pres., A. Ruderman & Co.

Airline

G. Marion Sadler	VP-customer service, American Airlines	Dir. passenger sales
James R. Cason	Contract sales mgr.-USA, Flying Tiger Line	Mgr. charter sales, Slick Airways
Kelbert Cheyno	VP-mtnce. & engrg., Alaska Airlines	Allegheny Airlines
Samuel P. Leib	Mgr. interline airfreight sales, American Airlines	Carrier Corp.
Daniel B. Priest	Asst. to VP-pub. rel., Air Transport Assn.	Pub. rel. rep., Pan American in New York
E. J. Minser	Gen. mgr. pass. service, U.S. Trans World Airlines	System staff dir. ground operations services
James E. Wood	On legal staff, Delta Air Lines	With Pogue & Neal Washington, D. C.
Robert Mark Mafoney	VP-sales, Aloha Airline	Asst. exec. dir., Hawaii Visitors Bureau
A. S. Walker	Eastern regional mgr., Slick Airways	Regional mgr., East Boston, Mass.
Robert B. Stevenson	System dir. customer service, Northeast Airlines	Worcester station mgr.
	Asst. to dir. sales, Northeast Airlines	Asst. to dir. traffic

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Gen. Baker given option on Capital Airlines stock

Maj. Gen. David H. Baker, who took over as president and chief executive officer of Capital Airlines on Aug. 1, was given an option on 10,000 shares of common stock as an "inducement" essential to his employment.

In an application to list 10,000 additional shares on the New York Stock Exchange, Capital revealed that the option extends from Aug. 1, 1957, to July 31, 1960. Baker may buy 2,500 shares by the end of the first year, 3,500 more by the end of the second, and 4,000 by the end of the third. Price is \$21.25625, or 95% of \$22.375, the highest price on Aug. 1.

Holloman base is renamed missile development center.

Holloman Air Development Center, near Alamogordo, N. M., has been renamed the Air Force Missile Development Center. Redesignation will in no way effect the missions and support requirements currently assigned the organization for functions not directly connected with the missile program.

Center will continue active research, development and test work in such areas as biodynamics and space biology, as well as its support of research by other Air Research and Development Command centers, military services and civilian contractual organizations.

Decca, IMHEP different

Bell Helicopter Corp. has asked that AMERICAN AVIATION call attention to the separate nature of the recently reported IMHEP and Decca programs (AMERICAN AVIATION, July 29, p. 38). The company says the Decca program is a "hardware development program aimed toward fuller immediate utilization of helicopters by using latest available hardware and instrument flight techniques."

FACILITIES

Nems-Clarke, Inc., has become an operating division of Vitro Corp. of America and has changed its name to Nems-Clarke Co. Allen S. Clarke remains as president.

National Water Lift Division of Cleveland Pneumatic Tool Co. has added 50,000 sq. ft. to its Kalamazoo, Mich. plant. Facility employs nearly 700 people in design, development and production of flight-control systems.

Narda Microwave Corp. has acquired two new buildings near its Mineola, L. I., plant. Contacts Inc., Wetherfield, Conn., has been formed to make electrical contacts exclusively.

ESC Corp. has opened a new Electronics Components division devoted to the development and manufacture of specialty transformers and associated electronic components. Location is at Palisades Park, N. J.

Lundy Manufacturing Corp. has purchased Ryan Industries Division of Detroit from Tectron, Inc. Ryan will be moved to the new Lundy plant at Glen Head, L. I., after work under way at Detroit is completed.

Applied Science Corp. of Princeton (N.J.) has opened a sales and service center for the southwest at Dallas. Dale S. Samuelson is senior representative at the new office.

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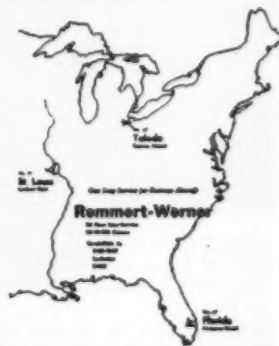
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EN ROUTE

by Wayne W. Parrish

New Guinea: peace and quiet and adventure, too

HAVING JUST ESCAPED from tropical Darwin, I found myself after a quick turnaround in Sydney back in the tropics again at Port Moresby on the southern coast of New Guinea, but quite a considerable distance east of Darwin.

I was tired and hot, but the little wooden terminal, open to the breezes, was rather cozy and the station agent had cold fruit juice and coffee for the customers. The gang of young teen-age Aussies who were to undergo quite a stretch of service in this jungle island got their bags and were taken away on a truck. A few of us were left to continue the remainder of the trip, an hour's flight, to Lae, another spot well known in World War II.

Much to my surprise the area around Port Moresby was brown. Somebody told me there is no rain eight months out of the year and yet, not far away, were the green mountainous jungles.

After takeoff I was invited again to the cockpit and had a wonderful view of the mountain crossing. A few native villages, a few clearings and paths, and the rest was jungle. When we reached the top I could see far ahead to the eastern and northern coastal areas which were fought over during the war. New Guinea was one of the real turning points. The Japs never quite got to Port Moresby, which served as a base for vast and tough operations in which the Japs were driven back to the north.

Tropical setting

Our Qantas DC-4 landed nicely at the airstrip at Lae, running right off the sea, and we pulled up in front of the busy little terminal. It was in a tropical setting. I was met by Orm (for Ormond) Denny, the Qantas manager for New Guinea and as legendary a character as you'll find in the aviation business today. He is one of the real greats, one of those who were pioneers in every sense of the word (with the old famed New Guinea Airways), and a man you like the minute you lay eyes on him.

Denny hadn't expected me until the next day. He had nothing on me. I hadn't expected to be there until next day either. But evidently I wasn't the most honored hero in Sydney and the sooner they could boot me up north, the better. But being a day early in no way dampened Denny's wonderful welcome.

And there began three of the most fascinating and rewarding days I've ever spent anywhere. I wouldn't take anything for the experience. New Guinea was an education, an eye-opener and a thrilling adventure, and I mean there were some top thrills which I intend telling you about; everything from a dip into the stone age where cannibalism is still rife, to landing on a steep strip on a mountain ridge 8,100 feet above sea level. New Guinea is a truly wonderful

experience and I give Australia all my votes for the terrific job it is doing there to develop both the natives and the country. And Qantas Empire Airways can take a good many bows, too.

Those who were at Lae during the war and haven't seen it since, both Aussies and Americans, would hardly recognize the place. Lots of nice homes, gardens, roads, parks, shops, a fine golf course and clubhouse, churches and everything that go to make up a nice little community. It is always hot and humid, but it really isn't too bad.

No air-conditioning but nice

Orm Denny took me to the Qantas guest house, used mostly for crews, and I was assigned a room in a cottage in a park-like area. They don't go in for air-conditioning in Lae and I think that's wise. No sudden changes of temperature that way. I took a shower, did my laundry and went to sleep. It was quiet except for some natives playing some sort of game some distance away and the strange sounds that come from New Guinea birds. To this day I remember the afternoon as one of the most peaceful and restful I've ever had.

In the late afternoon Denny picked me up and drove me around town and out to the clubhouse where I met a lot of the local gents who had just finished golfing. I was introduced as a strange bird who had flown over the North Pole a few weeks earlier. Then I went to Denny's comfortable house for a fine dinner. Life was indeed pleasant after two successive nights and 4,000 miles on a DC-4.

New Guinea made a big hit with me right at the start. I hadn't been on the ground very long when I passed a native and he tipped his hat and said "Good morning Master." Now I kinda like that. The more I heard this mark of respect the more determined I was to start life afresh back in Washington. Why shouldn't everybody at AAP treat me this way? (Never mind, I tried it; it just won't work these days. I'm still called the customary and that ain't so almighty wonderful.)

It was agreed that next morning Denny and I and Jack Stammer, one of Qantas' best pilots in New Guinea, would take off in a single-engined Beaver (built by de Havilland in Canada) and make a two-day tour of some of the 67 land strips served by Qantas up in the mountains and the highlands. At 6:40 a.m. I was greeted by that old English custom of being awakened with hot tea. After a good breakfast Denny picked me up and we drove to the airport.

It was in 1947 that the Australian government asked Qantas, a big international airline, to take over air operations in the mandated territory of New Guinea. The were about twenty operators then, and about eight now, but Qantas

was the airline charged with doing a development job in the national interest. The record has been superb.

Our first stop in the slow but sturdy Beaver was to be Bulolo. In fact we were to spend the night there at a new hotel called Pine Lodge. To get to Bulolo we flew up a long, narrow valley and over a lot of pretty rough country until we reached an extensive development in a large valley operated by the Bulolo Gold Dredging Co. and its subsidiary, Commonwealth New Guinea Timbers. Here had been the center of a great amount of gold dredging, one of the greatest in the world, since the 1930s. But the gold is about played out. One huge dredge worth \$250,000 had turned turtle a few days earlier and that left only one in operation, which I visited with Jim Snedden, one of the company officials.

From gold to plywood

In the afternoon we visited the big plywood factory and I learned that the U.S. has been a pretty sizeable customer. The plywood comes from the klinki and hoop pine and is of high quality. So the company that started out dredging gold has now turned to plywood in a big way. Quite an impressive installation.

The hotel is excellent, unusually good for an area in the jungle highlands. In fact they had a fine selection of wines and champagne. Mr. and Mrs. Bert Gazzard, general manager of the company, joined us for dinner and I ordered Monopole 1947 champagne for the occasion. It was served by a native naked above the waist. Never know about the jungles; you can find almost anything. I can well recommend the Pine Lodge Hotel if you ever chance that way.

Next morning we took off in the Beaver—its takeoff performance is quite remarkable—and flew through a narrow valley to Wau, one of the earliest settlements in the highlands and the center of a great gold mining boom starting in 1929. At one time when Orm Denny was flying for New Guinea Airways there were 100 plane movements a day at Wau. The airstrip is 2,300 feet and 3,500 feet altitude at the top. The lower end is about 500 feet lower. You never saw such an uphill airstrip in your life. The ratio must be about one in ten.

Back in the early 1930s it must have been quite a spot. There was no road from the coast so everything including huge dredgers had to be flown in. Best plane for heavy work was the old Junkers which had a removable top and the cargo loaded and unloaded by crane. A road was built to Lae during World War II and today, with the gold thinned out, Wau is a pleasant little mountain community growing vegetables for the lowlands. There are still a lot of miners trying to find that lost vein, however.

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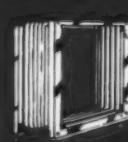
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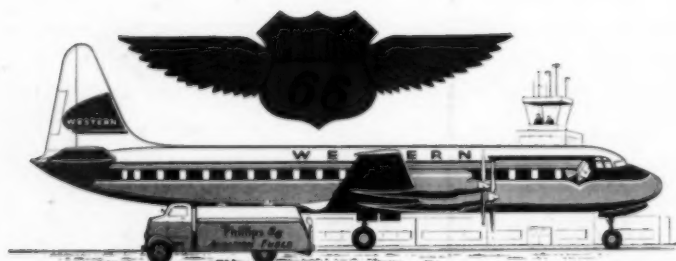
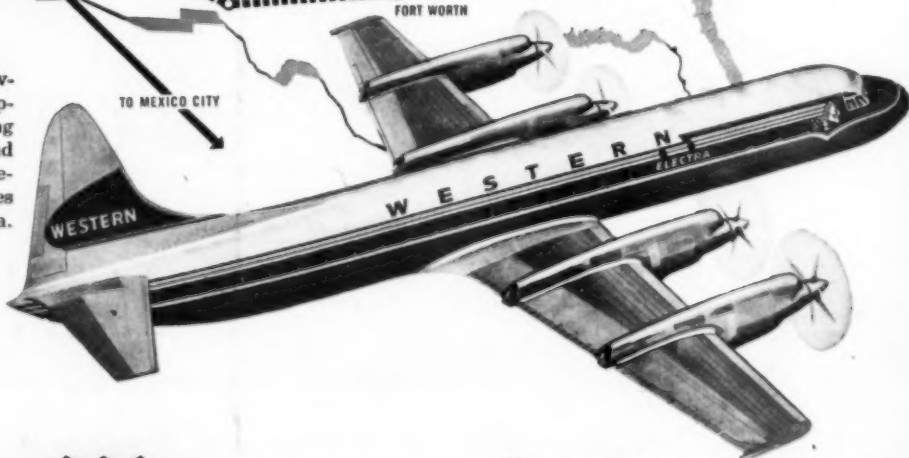
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